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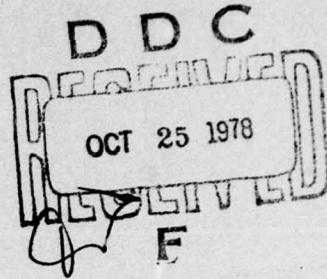
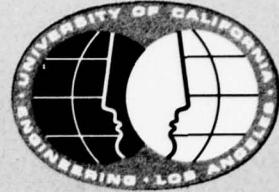


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Volume II.
TRANSIM V User's Manual.

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THE TRANSIM V MANUAL

Volume II

TRANSIM V User's Manual

Prepared for

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Project TRANSIM
School of Engineering and Applied Sciences
University of California, Los Angeles
August 1978

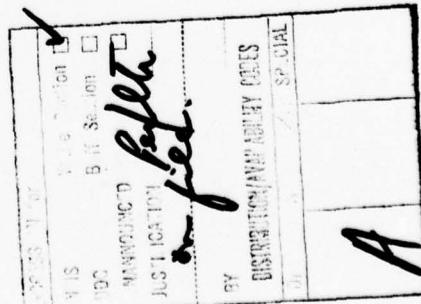
THE TRANSIM V MANUAL

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THE TRANSIM V MANUAL

Volume II

TRANSIM V User's Manual.

Volume II

TRANSIM V User's Manual.

A. GENERAL.

1. Background.

UCLA Project TRANSIM and its predecessor research and development project activities at UCLA have received contractual funding support from the Department of the Navy since 1951. Development of the original TRANSIM general-purpose computer simulator was completed by the UCLA Project TRANSIM staff in 1966 after a three-year development program sponsored by the U.S. Department of Commerce, Maritime Administration, and the Department of the Navy. Prior to 1963, the Office of Naval Research was Project TRANSIM's primary sponsor. In recent years, major Navy support has been furnished by the Naval Sea Systems Command (NAVSEA) and the Office of Naval Research (ONR), with secondary support from the Naval Facilities Engineering Command (NAVFAC) and Naval Electronic Systems Command (NAVELEX).

The general objective of the UCLA Project TRANSIM Program has been to provide ongoing development research and implementation of the UCLA-developed computer simulation techniques and to provide a training program which would assure successful Navy implementation of this program package. A specific research and development objective of Project TRANSIM was to develop general-purpose computer simulation to its ultimate as a versatile, economical, easy-to-use, and effective management tool. The basic developmental "vehicle" has been the TRANSIM general-purpose simulation technique. By virtue of its general-purpose

design, the TRANSIM approach offers the advantage of a single, versatile modeling technique capable of replacing individual special-purpose techniques now employed by the Navy. The latest version, TRANSIM V, is designed to be used as a management tool by the Navy in a number of different management problem situations, including:

A. Systems Analysis

1. Early analysis of requirements.
2. Evaluating alternative concepts, system equipment, facilities and operating policies.
3. Determining efficient manning levels and resource allocation.
4. Calculating reliability vs. maintainability tradeoffs.
5. Determining integrated logistics support resource requirements.

B. Project Risk Management

1. Technical tradeoff analysis.
2. Planning.
3. Cost estimating.
4. Scheduling.
5. Resource allocation.
6. Project control (resource management and budget).
7. Change order impact analysis.

C. Production Scheduling

1. Shipyards.
2. Other Navy industrial installations.
3. Navy ship system contractors.

D. Risk Analysis

1. Technological risks.
2. Schedule risks.
3. Make-or-buy decision risks.
4. Cost and capital investment risks.

The technique is designed to exploit to the fullest the user's knowledge of problem situation and environment peculiarities while minimizing his involvement with tedious computer-oriented chores

by adhering to the principle of user-orientation, the TRANSIM computer-based techniques can be successfully used by personnel who are not familiar with computer programming and technology.

The "end products" of the UCLA Project TRANSIM Research and Development Program are currently in effective use on numerous Navy projects. Based upon the feedback experiences from such actual applications, it has been possible to improve, update, and expand the analytical power of the technique while increasing its analytical efficiency. This continuing development capability has resulted in the development of the current TRANSIM V version which has considerably more analytical power and efficiency than the original TRANSIM I and interim versions.

2. Description of TRANSIM V.

Unlike conventional critical-path network techniques, TRANSIM V can account for uncertainty in project planning and performance. The availability of the TRANSIM technique makes feasible project risk analysis and risk management of highly complex projects.

Management has long known of the existence of risk on many projects, but has not had a convenient and rigorous means of determining how much risk exists and how to control it. With TRANSIM V, project management can:

- o Determine the level of risk associated with its adopted project plan, schedule, and budget.
- o Develop a project plan, schedule, and budget conforming to a level of risk acceptable to management.
- o Control the project from beginning to end within acceptable limits of schedule and budget risks.

a. Planning with TRANSIM V.

The network planning of a project is the arranging of the precedence and sequence of project tasks as appropriate to provide the "road map" for project execution. Probabilistic planning of projects which can be either event- or activity-oriented (or a combination of both) differs only slightly from conventional, deterministic planning.

The probabilistic planner may include in his listing of project activities those not having a 100% likelihood of being performed at all; or, if performed, may not always follow the same sequence. For example, a design task may not have a 100% probability of realizing approval; some changes may have to be made. The planner can account for such uncertainty by providing a probabilistic network branch with an estimated chance of being realized. Similar probabilistic branches may be required to represent other planning uncertainties (i.e., the failure of a test would require diagnosis, corrective action, and a retest).

b. Scheduling with TRANSIM V.

Project managers are not universally aware that the expected project completion time produced by deterministic methods has, perhaps, as much as a 45 to 50% probability of being exceeded. This can have important consequences when the project completion date is keyed to such important events as starting the operation of a production line, moving into a new building, or a new bank, or completing the building of a ship. By definition, the deterministic "expected" completion time does not account for the actual range of completion times which result from the aggregation of all project uncertainties.

TRANSIM V utilizes the estimator's full range of experiences for its input data as a more accurate basis for schedule decisions. Whereas conventional, deterministic techniques utilize a single value which may be optimistically or pessimistically biased, the input to TRANSIM V involves a range of values from the smallest to the largest probable value. This bracketing of activity durations and the probabilities of various activity times falling within the bracket usually cancels out any personal bias on the part of the estimator and provides a far better indepth estimate for schedule purposes.

TRANSIM V produces as output the distribution of project completion times. The project manager then has available a data presentation which will allow his selection of a completion date compatible with an acceptable level of risk. For example, there might be a 10-20% likelihood that the actual project completion date may exceed the "expected"-date by 30%. In the case of a ship construction project, he might accept a scheduled completion date which has a 75% probability of being attained. For the delivery of a newly developed sonar system, the importance of the equipment to ship construction may cause selection of a procurement lead time schedule which will provide a 98% assurance that the equipment will be delivered in time.

Because capacity for risk-taking differs among individuals and for different project circumstances, each project manager on each different type of project has his own unique acceptable level of risk which is dependent upon considerations such as cost, size of investment, interaction with other projects, lost revenue, weather (completing before winter, etc.), and availability of budget funds. The ability of the

project manager to select a project schedule to fit the degree of acceptable risk is one of the unique features of the probabilistic network analysis technique.

c. Resource Allocation with TRANSIM V.

Projects always make demands on resources such as manpower, materials, machines, tools, facilities, and capital. All project schedules typically suffer from some scarcity of resources and the net effect is always to delay completion. As a result, analysis to determine how level of available resources affects scheduling is critical to effective project management.

Several of the conventional network techniques can account for resource requirements and the net effects on schedule caused by limitations in resource availability. Typically, the planner first develops the schedule. Next, he sums up the net requirements for each of the resources. Usually, the level of required resources will show intolerable peaks and valleys when viewed over the length of the project. If resources were unlimited, the management task would be simple: To merely assure that the resources were at the right place when required. However, due either to cost or to insufficient supply (such as highly specialized skills), most resources are severely limited, and the planner will "level" them. In other words, he will establish a resource level compatible with project objectives, cost, and resource availability. Establishing resource requirements using this deterministic technique is straightforward but inaccurate.

On real-life projects, the assignment of resources must also be dependent upon the variable start and finish dates of individual project activities. Thus, the probabilistic network planner deals with "probabilities" of different levels of resources being required on different project dates as will be experienced once the project is actually underway. As in the case of probabilistic scheduling, the resource decision will be dependent upon the acceptable level of risk. For a critical activity or for projects with firm completion commitments, a low risk level might be appropriate. For others, a higher risk level might be tolerated.

B. INPUT DATA.

1. Data Requirements

TRANSIM V, like other general purpose modeling techniques, can accept input data at any level of detail. Depending upon the availability of and the need for detail, a model may be very detailed in one area and relatively gross in other areas. For example, a ship acquisition project model will initially concentrate on design details; later on, as the project progresses, detail emphasis will shift to construction, then to outfitting, sea trials, and so on.

Data may be derived from the most reliable and readily available sources. Experience has shown that with proper interviewing techniques, subjective estimates of activity performance time obtained from experienced personnel are generally superior to experience data based on inadequate sample sizes (See Engineering Report No. 7111, Bongers, L. S. "Obtaining Task Time Data from Human Store and Factors Affecting Retrieval," December 1971.)

2. Data Preparation

For systems analysis applications only, please refer to the TRANSIM User's Manual (UCLA Engineering Report No. 7168, December 1971) and Supplement (UCLA Engineering Report No. 7443, August 1974).

The following sections of this manual apply to project risk management applications only. TRANSIM V data preparation is accomplished through the aid of preprinted data sheets. FORMS C-0 through C-15A, as described below, serve to collect all the data necessary to set up and execute a model, and include complete output report specifications. When completed, the forms are processed for the computer as described in

Section C., "Computer Operations."

a. TRANSIM V Input Data Sheets.

(1) FORM C-0 (RUN TITLE, STORAGE ALLOCATION AND WORKDAY/CALENDAR DATE CONVERSION DATA).

The data described on FORM C-0 should appear at the beginning of the TRANSIM V input data deck.

FORM C-0 input begins with the RUN TITLE CARD which gives, in Columns 1-72, the title to be printed at the top of each page of output. It is recommended that the date of the run and/or a run number always be included in the title in addition to the name of the project.

The INTERNAL DATA STORAGE REQUIREMENTS CARD is the second input item on FORM C-0. The number of required internal storage words should be the only entry on the second input card and can appear anywhere in Columns 1-72. However, as seen in FORM C-0, for consistency purposes Columns 54-59 have been allocated for appropriate storage requirement entry.

The relationship between the internal data storage and the actual machine storage requirements to be specified in the job control deck is dependent on the installation where the job is being run. However, the internal data storage requirements for a given network is approximately the same for any installation.

For any network, the total data storage requirements can be approximated by the following formula:

$$T = 70A + RD(10+P)$$

PROJECT
DATE

TRANSMIT INPUT DATA SHEET FORM C (HOURLY TITLE, STORAGE ALLOCATION AND WORKDAY CALENDAR) DATE CONVERSION DATA
Key punches: On this form, do NOT punch data in shaded columns

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FIGURE 1.

where T = Total number of words of storage space required;

A = Total number of activities in a network;

RD = Total number of resource pools to be reported on multiplied by the average number of workdays (or time periods, if time periods are used) over which the resource/cost pools are in use; and

P = Total number of words used for percentile resource or cost reports. (If there are no percentiles, P will be zero.)

$$\text{where } P = \underbrace{\left(\frac{I}{100} (n + 100 - u) + 4 \right)}_{\text{(percentiles)}} + \underbrace{\left(\frac{I}{100} (N + 100 - U) + 4 \right)}_{\text{(cumulative percentiles)}}$$

with I = The number of iterations

n = The lower percentile for the resource or cost report

u = The upper percentile

N = The lower percentile for the cumulative value

U = The upper percentile for the cumulative value

For example, if the total number of activities in the network is 662, and resource pool AA is in use on the average from time period 100 through 174; pool BB from time period 110 through 127 and again from time period 133 through 150; and pool CC from time period 212 through 406; then the total number of words of data storage required for the network would be approximately:

$$(70 \times 662) + (3 \times \frac{306}{3} \times 10) = 49,400$$

or 46,340 words for activities and 3,060 for resource reports.

As an example of percentile storage requirement, consider a network with 600 activities and two cost codes, BCOST and TCOST. BCOST is used from time period 100 through 149 and TCOST from time period 100 through 199. For BCOST, we ask for cost report percentiles 10 and 90 and cumulative percentiles 5 and 95. For TCOST, we ask for cost report percentiles 2 and 98. One hundred iterations are run.

Then:

$$\begin{aligned}
 T = & 70 \times 60 + 50 \left(10 + \underbrace{\left(\frac{100}{100} (10 + 100 - 90) + 4 \right)}_{\text{BCOST percentiles}} \right) \\
 & + \underbrace{\left(\frac{100}{100} (5 + 100 - 95) + 4 \right)}_{\text{BCOST cumulative}} + 100 \left(10 + \right. \\
 & \left. \underbrace{\left(\frac{100}{100} (2 + 100 - 98) + 4 \right)}_{\text{TCOST percentiles}} \right)
 \end{aligned}$$

$$\begin{aligned}
 T = & 42,000 + 2,400 + 1,800 \\
 = & 46,200
 \end{aligned}$$

In the above example, the resource/cost reporting requirements are small relative to the requirements for activities. However, in many cases, the opposite is true either because the number of resource/cost pools is large, or because their use extends over many workdays/time periods, or both. In such a case, the data storage requirements may be reduced, if necessary, by either increasing the size of the time period (which is by default one workday, if not otherwise specified on Form C-10), or by suppressing printing of reports for some of the

resource/cost pools (by means of Forms C-14 and C-15A). More than one computer run may be made if necessary in order to obtain all the reports needed for analysis without loss of correlation of results, because the simulation will be identical from run to run if no changes are made in the input data (except, of course, for the report specifications).

The report given at the end of each run, giving the maximum data storage used, is an accurate accounting and can be used with confidence to predict future requirements for similar runs.

WORKDAY/CALENDAR CONVERSION SPECIFICATIONS--"YES" or "NO".

If "NO", then simply enter "NO" and go to the next form. The output reports will be specified in terms of the relative number of workdays from the beginning day of the network.

If "YES", enter "YES" and go on to the next line where the BEGINNING DATE should be entered. If "YES" is entered in WORKDAY/CALENDAR CONVERSION SPECIFICATIONS, cross out those days of the week not applicable (i.e., nonworking days) and list below this where indicated, those holidays taken which fall on a normal working day. For example, July the Fourth falls on a Tuesday in 1978, which is normally a working day. List 4 July 1978 in one of the columns as specified below (Keywords for months are listed on the sheet and are to be used in all cases where date entry is necessary). HOLIDAYS listed do not have to be in sequence.

(2) FORM C-1 (ACTIVITY/MILESTONE LIST).

The ACTIVITY/MILESTONE LIST (FORM C-1)

follows FORM C-0. Entered on this form is the ACTIVITY/MILESTONE CODE, ACTIVITY/MILESTONE DESCRIPTION, and RESPONSIBILITY CODE. There are as many lines as there are Responsibilities coded for any given activity.

BASIC DEFINITIONS.

ACTIVITY. An ACTIVITY is a specific task to be performed.

MILESTONE. A MILESTONE is an activity whose performance time is essentially zero and does not take any resources; e.g., final delivery or acceptance of a group of tools.

RESPONSIBILITY. A RESPONSIBILITY is the individual, department, or code in charge of performing the listed activity.

ACTIVITY/MILESTONE CODE.

Coding of the activity entered on this form should be done in as simplified and clear a form as possible. The code must consist of a minimum of two and a maximum of eight contiguous characters--NOT LISTED AS A KEYWORD.

Some acceptable codes are:

01

A1

NAM3

56678

JOB00101

Some unacceptable codes are:

MONTH (keyword)

TRANSIM V FORM C-1
ACTIVITY/MILESTONE LIST

Keypunch: Punch data in shaded columns only when followed by user supplied data in the next (unshaded) field to the right

PROJECT	DATE	ACTIVITY/MILESTONE CODE (Minimum two characters)	ACTIVITY/MILESTONE DESCRIPTION (Do not use the character " " within the activity description)	RESPONSIBILITY (One responsibility one line) (Minimum two characters)	CARD SEQUENCE OR IDENTIFICATION (Optional)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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</table>						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000						

FIGURE 2.

1.01 (decimal number)

A (only one digit; minimum of two necessary)

AB 12 (noncontiguous characters)

Remember that these rules apply to all codes whether they be ACTIVITY/MILESTONE, RESPONSIBILITY, or EXHIBIT references, and that they are unique to their elements throughout the TRANSIM V package.

ACTIVITY/MILESTONE DESCRIPTION.

ACTIVITY/MILESTONE DESCRIPTIONS can be a combination of alphanumeric characters and blank spaces. It provides a "shorthand" description of the activity, unless a complete description can be given in the 40 columns allotted on the computer card for this purpose.

The Description appears, along with the Activity Code, on all output reports pertaining to Activity Schedules. A missing description will result in a warning message.

RESPONSIBILITY CODE.

Like the Activity/Milestone Codes, the Responsibility Codes consist of two to eight contiguous characters which have not been listed as a keyword. These codes are used to produce separate, selected Activity Schedule Reports in addition to a master Schedule Report, which includes all activities irrespective of their Responsibilities.

The RESPONSIBILITY CODE is entered on the same line as the ACTIVITY/MILESTONE CODE and DESCRIPTION. If there is more than one Responsibility for a specific activity, they are listed on the following line(s).

CARD SEQUENCE or IDENTIFICATION (optional).

TRANSIM V does not interpret any data punched in this section. This

section is most commonly used to provide identification and/or sequencing information as an aid in handling large data decks.

Certain installations have facilities which enter SEQUENCE NUMBERS automatically in these columns (i.e., this is done by the on-line editing features of many time-sharing computer systems).

(3) FORM C-1A (SCHEDULE START AND FINISH DATES).

ACTIVITY/MILESTONE CODE taken from TRANSIM V

FORM C-1 is entered in the first column of FORM C-1A.

For each ACTIVITY/MILESTONE CODE, a "SCHEDULE START" DATE and a "SCHEDULE FINISH" DATE may be listed. These dates are for referential use only. They do not influence the simulation results in any way.

FIGURE 3.

(4) FORM C-2 (ACTIVITY DATA)

ACTIVITY/MILESTONE CODES should be taken from FORM C-1 and listed on FORM C-2.

Information on PREDECESSOR ACTIVITIES, RESOURCE REQUIREMENTS, and WORKING TIMES for each specified activity should be entered on this form.

There should be a minimum of one line. There can be a maximum of as many lines as there are PREDECESSOR ACTIVITIES or as many lines as there are RESOURCE REQUIREMENTS--whichever is greater.

Reference of the project network drawing and FORM C-1 would be necessary to determine PREDECESSOR ACTIVITIES and respective ACTIVITY/MILESTONE CODES assigned to these activities.

(a) ACTIVITY/MILESTONE CODES

Taken from FORM C-1 and entered here.

(b) PREDECESSOR ACTIVITIES

A PREDECESSOR ACTIVITY is an activity that precedes a specific activity. There can be more than one PREDECESSOR ACTIVITY for any given activity.

For the BEGINNING ACTIVITY, the word "NONE" would be entered as its PREDECESSOR ACTIVITY. There may be more than one beginning activity in a given NETWORK; however, all activities must eventually lead to a single end activity.

List the first PREDECESSOR ACTIVITY (taken from the NETWORK by CODE (either marked on the NETWORK or taken from FORM C-1). If there is more than one PREDECESSOR ACTIVITY, list them all on successive lines.

FIGURE 4.

(c) RESOURCE REQUIREMENTS

For any given activity, there may be one or more RESOURCE CODE(S). These are listed in sequence corresponding to the given activity -- the first RESOURCE CODE is listed on the same line as the corresponding activity; each additional Resource is listed on each succeeding line.

(d) QUANTITY

The QUANTITY of the Resource required is listed corresponding to the specific RESOURCE TYPE CODE. Decimal fractions with one or two digits to the right of the decimal point may be used.

QUANTITY is taken as the average level of Resource application over the entire duration of the activity.

No entry in a corresponding COST REPORT will appear for a given activity where a RESOURCE entry is zero.

(e) SCHEDULED HOLD PRIOR TO ACTIVITY START

Use this section whenever it is desired to deliberately hold an activity for a specified number of workdays following completion of all its PREDECESSOR ACTIVITIES.

(f) WORKING TIME EXPENDED TO DATE

If workdays have already been spent on activity listed, then enter number of days spent here; otherwise, leave blank. Entry can be made in terms of whole days and in decimal fractions. If actual start and finish dates are known, use Form C-9 instead.

(g) WORKING TIME EXHIBIT REFERENCE

List EXHIBIT REFERENCE CODES here when

time estimates are variable.

(h) PERFORMANCE TO CONTINUE UNTIL THE
START OF ANOTHER ACTIVITY

Entry of ACTIVITY/MILESTONE CODE designated as the TARGET ACTIVITY is made here when it is necessary to extend the duration of one activity to the start of another (not necessarily an immediate successor in a given net). The entry is made on the same line as the ACTIVITY/MILESTONE CODE.

NOTE: The START of the TARGET ACTIVITY is defined for this purpose by the completion of all its PREDECESSORS, followed by the completion of any hold time specified for the TARGET ACTIVITY on FORM C-2.

(5) FORM C-2A (PROBABILISTIC AND CONDITIONAL SUCCESSORS)

ACTIVITY CODES for PROBABILISTIC SUCCESSORS along with their corresponding percentage probabilities are entered into columns where indicated. Codes for the activity designated a PROBABILISTIC SUCCESSOR are taken from FORM C-1 and entered in columns 10-17; one successor activity per line. Use as many lines as there are SUCCESSOR ACTIVITIES.

Beginning on the same line as the last listed PROBABILISTIC SUCCESSOR, go to the PREDECESSOR ACTIVITY CODES column, and enter ACTIVITY CODE(S) of those activities that precede this PROBABILISTIC SUCCESSOR or set of SUCCESSORS. If there is more than one PREDECESSOR ACTIVITY to the given SUCCESSOR, list their codes (taken from FORM C-1) using as many lines as are necessary.

If a group of PREDECESSOR ACTIVITIES is shown, the probability of branching to a specific group of SUCCESSOR ACTIVITIES should be shown just once, on the same line as the first PREDECESSOR ACTIVITY of the group.

PROJECT _____ DATE _____

PROJECT _____ DATE _____

TRANSMIV INPUT DATA SHEET I
PAGE _____ OF _____
FORM C-2a (PROBABILISTIC AND CONDITIONAL SUCCESSORS)

ALL SETS OF SUCCESSORS (PROBABILISTIC or CONDITIONAL) must have the same PREDECESSOR or set of PREDECESSORS and these relationships must be shown on FORM C-2 also, beginning on the same line as the last of the possible SUCCESSORS.

CONDITIONAL SUCCESSORS are those SUCCESSOR ACTIVITIES whose start is dependent upon the "START" or "FINISH" of another activity. If, for some reason, the specified activity has not "STARTED" or "FINISHED", an alternative SUCCESSOR ACTIVITY is listed. All ACTIVITY CODES are obtained from FORM C-1.

CARD SEQUENCE or IDENTIFICATION (optional):

(6) FORM C-2B (PROBABILISTIC AND CONDITIONAL PREDECESSORS)

Enter on FORM C-2B those PREDECESSORS that have been defined as PROBABILISTIC or CONDITIONAL.

ACTIVITY CODE (taken from FORM C-1) for a designated activity with a set of PROBABILISTIC or CONDITIONAL PREDECESSORS is entered in the first column.

ACTIVITY CODES (taken from FORM C-1) of PROBABILISTIC PREDECESSOR ACTIVITIES and their corresponding PROBABILITIES are entered in column 3 and 2, respectively. Caution must be taken to insure that all PREDECESSOR ACTIVITIES in a set are complete before going on to another. Enter the probability just once for each set of PREDECESSORS (adjacent to the first predecessor of the set).

ACTIVITY CODES (taken from FORM C-1) for PREFERRED CONDITIONAL PREDECESSORS (or set of PREDECESSORS) are entered where indicated.

Required conditions (i.e. the "START" or "FINISH" of another designated

PAGE OF

TRANSIM V INPUT DATA SHEET FORM C-2b (PROBABILISTIC AND CONDITIONAL PREDECESSORS)

PROJECT _____
DATE _____

FIGURE 6.

activity), are then listed on the same line as the last Predecessor of the set.

CARD SEQUENCE or IDENTIFICATION (optional)

(7) FORM C-3A (ACTIVITY TIME EXHIBIT)

This form for entry of ACTIVITY TIME EXHIBITS includes given percent probabilities for each of the three TIME ESTIMATES (Optimistic, Most Likely, and Pessimistic). Entered along with these time estimates are corresponding probabilities. These probabilities must add up to 100 percent.

TIME ESTIMATES are number of workdays measured from activity start to activity completion. Basic assumptions are that all Predecessors to the Specified Activity have been completed and that all required resources are available. If delay in the net occurs because of incomplete Predecessors or unavailability of resources, it will automatically be picked up by the computer.

TIME may be expressed in whole workdays and/or decimal fractions of a workday (i.e. 10 (days); 5.24 (days); 6.5 (days); .75 (days)). TIMES are expressed by an "OPTIMISTIC" or minimum value, "MOST LIKELY" and "PESSIMISTIC" or maximum value. They are defined as follows:

OPTIMISTIC VALUE--minimum time that the activity might take to complete. Minimal completion time would occur where no problems occur and the activity proceeds smoothly to completion with very little, if any difficulty.

MOST LIKELY VALUE--normal time taken to activity completion with typical but no unusual or difficult problems.

PROJECT		DATE		EXHIBIT NUMBER OR NAME (From Form C-2)										EXHIBIT NUMBER OR NAME (From Form C-2)									
				10										10									
				09										09									
				08										08									
				07										07									
				06										06									
				05										05									
				04										04									
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				33										33									

FIGURE 7.

PESSIMISTIC VALUE--maximum time taken to completion of an activity taking into consideration unusual problems causing some extensive difficulties resulting in major setbacks to activity completion.

It is preferable that there be a one-to-one correspondence between Exhibit Time References and Specified Activity. Doing so will eliminate the possibility that a change in time estimate made for one activity will not be mistakenly applied to another activity as well.

However, EXHIBIT TIMES may be referenced by more than one activity if it is so desired.

EXHIBIT NUMBER or NAME is taken from FORM C-2 and entered into the first column.

PROBABILITIES and corresponding time estimates are entered as indicated on the form and as specified earlier in this write-up (i.e. Optimistic, Most Likely, and Pessimistic).

CARD SEQUENCE or IDENTIFICATION (optional)

(8) FORM C-3B (ACTIVITY TIME EXHIBIT)

FORM C-3B is used when there are no PROBABILITY entries. It assumes that a modified triangular distribution is used wherein OPTIMISTIC and PESSIMISTIC TIME LEVELS are assumed to be at the 5% probability level, uniformly rising--on both sides-- to a MOST LIKELY TIME VALUE at a maximum percentage of probability of its occurrence.

As stated for FORM C-3A, workdays are entered in whole days and/or in decimal fractions (i.e., 10, 5.2, .7, etc.).

(9) FORM C-3C (ACTIVITY TIME EXHIBIT)

This form is used for EXHIBITS containing TIME ESTIMATES with PROBABILITIES for the "OPTIMISTIC" and/or "PESSIMISTIC" times only. Obtain EXHIBIT NUMBER from FORM C-2.

NOTE: A modified triangular or house distribution is assumed wherein OPTIMISTIC and PESSIMISTIC TIMES may be unequal. For example, the OPTIMISTIC TIME of a given EXHIBIT may be 5% and a PESSIMISTIC TIME may be 10%. If both PROBABILITY entries at the ends are omitted from any EXHIBIT, then 5% will be assumed for both OPTIMISTIC and PESSIMISTIC PROBABILITY VALUES. However, if a PROBABILITY VALUE is entered at the OPTIMISTIC end only, it will be applied to the PESSIMISTIC side also. If a PROBABILITY VALUE is entered at the PESSIMISTIC end, the 5% default will be applied to the OPTIMISTIC end.

(10) FORM C-4A (RESOURCE POOL DATA AND RATE/COST TABLE)

This form lists RESOURCE CODES and DESCRIPTION along with total number initially available in the RESOURCE POOL and RATE

FIGURE 8.

FIGURE 9.

PAGE — OF —
 TRANSIM V INPUT DATA SHEET FORM C-4A (RESOURCE POOL DATA AND RATE/COST TABLE)
 Keypunch: Punch data in shaded columns only when supplied by user (punched) Then to the right

PROJECT	DATE	RESOURCE TYPE NAME OR CODE (Indicates two characters)	RATE/COST PER RESOURCE UNIT D = DAILY H = HOURLY (DOLLARS)	RATE/COST EFFECTIVE FROM ON CONSOLIDATE LEAVE BLANK MONDAY OR YEAR	CARD SEQUENCE ON IDENTIFICATION (Indicates)	NUMBER OF UNITS AVAILABLE INITIALLY AVAILABLE IN POOL IF LEAVE BLANK		
						1	2	3
						1	2	3
						4	5	6
						7	8	9
						10	11	12
						13	14	15
						16	17	18
						19	20	21
						22	23	24
						25	26	27
						28	29	30
						31	32	33
						34	35	36

FIGURE 10.

or COST PER RESOURCE UNIT (per day or hour and effective from a specified workday).

As mentioned before, like the ACTIVITY CODE, the RESOURCE TYPE NAME or CODE must consist of a minimum of two and a maximum of eight contiguous alpha-numeric characters.

DESCRIPTION is optional, but if to be listed, it is preferable to enter it exactly as it appears in the RESOURCE REPORT TITLE. The RESOURCE DESCRIPTION may consist of any combination of alpha-numeric characters and blank spaces.

The NUMBER of RESOURCE UNITS initially available in the pool (from which the requirements of individual activities will be drawn) may be expressed as an integer number or as a decimal number with one or two digits to the right of the decimal point (hundredths of units). Care must be taken to insure that the QUANTITY is large enough to meet the demands of any individual activity drawing from that pool, because no activity is allowed to begin until all of its resource requirements are available. If two or more activities require resources from the same pool and there are not enough resource units available to allow simultaneous performance of all those activities, then the resources will be allocated to as many activities as possible, with preference given to those activities that have been waiting the longest; i.e. those whose PREDECESSOR ACTIVITIES were all completed at the earliest times. In no case will the number of resource units assigned to an activity be less than the number shown as "required" on FORM C-2.

RATE/COST PER RESOURCE UNIT. Enter dollar amount of cost per RESOURCE UNIT on a daily (D) or hourly (H) rate.

RATE/COST EFFECTIVE FROM DATE. Enter DATE (day, month, year) that the RATE or COST is effective. If COST/RATE remains the same, leave blank.

If COST/RATE changes, list beginning COST/RATE per resource unit. Then, on the next line, list new COST/RATE and in its corresponding column, enter in the date that this new rate is effective.

CARD SEQUENCE or IDENTIFICATION (optional)

As previously mentioned (See Brief on FORM C-1).

(11) FORM C-9 (COMPLETED AND/OR UNDERWAY ACTIVITIES ONLY).

Enter ACTIVITY CODE of given ACTIVITY taken from FORM C-1 as indicated. For COMPLETED ACTIVITIES, enter START and COMPLETION DATES, as indicated.

For UNDERWAY ACTIVITIES, enter START DATE and DATE OF UPDATE. Then, enter an EXHIBIT REFERENCE for the estimated Time to Completion.

RESOURCE REQUIREMENTS should be entered on this form even if they are the same as those already entered on FORM C-2. Then the C-2 entry should be deleted.

RESOURCE TYPE NAMES or CODES must correspond to FORM C-4A. For any given activity, there may be one or more RESOURCE CODE(S). These are listed in sequence following their corresponding activity.

If ACTIVITY PERFORMANCE of the SPECIFIED ACTIVITY is to continue to the start of another activity, enter in designated column the appropriate ACTIVITY CODE (taken from FORM C-1).

FIGURE 11.

(12) FORM C-10 (GENERAL)

The UPDATE line is used to establish an overall "date of update" for the run. The number of workdays actually spent on each individual activity to date may be entered in the appropriate columns on FORM C-2. The actual START DATE and DATE OF UPDATE may be entered on FORM C-9.

The TIME PERIOD LINE is used to determine the time scaling of the output reports. The time period is normally set equal to one workday; however, on lengthy projects, it is often desirable to have the reports somewhat condensed. For example, in a lengthy project where one work-week equals five workdays, the time period might be specified as five workdays, resulting in presentation of all output reports in terms of five-day (workweek) intervals.

The NUMBER OF RESOURCE UNIT HOURS PER RESOURCE UNIT WORKDAY refers to the number of hours worked per day (8, 16, 24, etc.) as presented in the RESOURCE UTILIZATION HISTORY REPORT. The keyword, "ITERATIONS" is used to specify the number of successive iterations or project network simulations desired.

If multiple copies are specified, the total requested for each report will be printed before going on to the next report.

Additional instructions for desired format and editing options are listed next. Options not utilized should be crossed out.

10 GENES

INPUT DATA SHEET FORM C 10 (GENERAL)

PAGES 0€

1104

(13) FORM C-10A (RISK REPORT SPECIFICATIONS)

If a SCHEDULE RISK REPORT is desired, enter "YES" in the space (columns 22-24) allocated next to SCHEDULE RISK REPORT. If "NO", enter "NO" and go to the next form.

SORT OPTIONS for the SCHEDULE RISK REPORT are listed on the form. Cross out the options NOT desired and enter number of desired copies.

Enter ACTIVITY/MILESTONE CODES (taken from FORM C-1) of Activities to be included in the Risk Report. List the corresponding "LEAD RESPONSIBILITY" which is the first Responsibility listed for each designated Activity. Enter APPROVED SCHEDULE DATE and designate as indicated on this form the type of approved schedule date ("B" entered if it is an Activity Beginning Date; "C" entered for Activity Completion Date; and "M" for Milestone Date).

Enter ACCEPTABLE LEVEL OF RISK as given in percentages.

For specified ACTIVITIES(MILESTONES), a punched output deck can be produced and will have the following information:

- o Activity/Milestone Code
- o Approved Schedule Date
- o Probability of Meeting Approved Schedule Date
- o Acceptable Risk Level
- o Date of Meeting Acceptable Risk Level
- o Percent Criticality

For subsequent runs, the punched deck should be inserted before the "GO" card of the Input Deck.

PROJECT		DATE		ACTIVITY/MILESTONE CODE (From Form C-1)		LEAD RESPONSIBILITY (Minimum two choices)		APPROVED SCHEDULE DATE B - Activity Beginning Date C - Activity Completion Date D - Milestone Date (If none, check)		ACCEPTABLE RISK LEVEL (Percent)		CARD SEQUENCE (Leave blank)	
TRANSMIT V INPUT DATA SHEET FORM C 10A (RISK REPORT SPECIFICATIONS)				RISK REPORT CROSS MILESTONE CODE		NOT DESIRED		NO		P			
Keypuncher: On lines 1 through 6 do NOT punch date in shaded columns On lines 1 through 34 punch date in shaded columns only when followed by one supplied date in the next (unshaded) field to the right				REPORTS		ENTER "YES" OR "NO"				P			
(*Enter number only if this number differs from previously specified number of copies of output report(s) to be printed)				OPTIONS		OUT OPTIONS				P			
Analyze field in block				ACTIVITY		NOT DESIRED				P			
				APPROVED		NOT DESIRED				P			
				DECREASING		NOT DESIRED				P			
				LEAD RESPONSIBILITY		NOT DESIRED				P			
				ACTIVITY/MILESTONE CODE		NOT DESIRED				P			
				CROSS MILESTONE CODE		NOT DESIRED				P			
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				LEAD RESPONSIBILITY		NOT DESIRED				P			
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				CROSS MILESTONE CODE		NOT DESIRED							

FIGURE 13.

(14) FORM C-11 (TIME SUMMARY GRAPHS)

TIME SUMMARY GRAPHS present a histogram of the range of possible elapsed times between specified activities or milestones, or a distribution of start or finish times for a given activity.

It is possible to enter data for two TIME SUMMARY GRAPHS on this form. Enter title of Time Summary Graph to be obtained (lines 1 and 14). Additional data is entered on the next twelve lines where indicated.

TIME SUMMARY GRAPHS are presented in terms of calendar dates only if calendar information is included on FORM C-0 and if a starting activity is not given; otherwise, the report is presented in terms of workdays (or if specified on FORM C-10, in time periods).

If the distribution specifications are not given, the computer will scale the distribution automatically to fit on a single page. Otherwise, the computer will use as many pages as are required to meet the specifications.

For runs in which the number of iterations is greater than 100, fractional percentage occurrences within any interval will be rounded upward or downward to the nearest percent; for example, a 1-in-250 occurrence will be rounded to 0% and will not appear on the graph.

TRANSIM V INPUT DATA SHEET FORM C-11 (TIME SUMMARY GRAPHIC)

(Please number only if this form differs from previously issued or copies of previous report(s) to be printed)

(See instructions below)

And at following instructions below

PROJECT	DATE	CARD SEQUENCE (Top row)											
		1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	1	1	1	1	1	1	1	1	1	
2	2	2	2	2	2	2	2	2	2	2	2	2	
3	3	3	3	3	3	3	3	3	3	3	3	3	
4	4	4	4	4	4	4	4	4	4	4	4	4	
5	5	5	5	5	5	5	5	5	5	5	5	5	
6	6	6	6	6	6	6	6	6	6	6	6	6	
7	7	7	7	7	7	7	7	7	7	7	7	7	
8	8	8	8	8	8	8	8	8	8	8	8	8	
9	9	9	9	9	9	9	9	9	9	9	9	9	
10	10	10	10	10	10	10	10	10	10	10	10	10	
11	11	11	11	11	11	11	11	11	11	11	11	11	
12	12	12	12	12	12	12	12	12	12	12	12	12	
13	13	13	13	13	13	13	13	13	13	13	13	13	
14	14	14	14	14	14	14	14	14	14	14	14	14	
15	15	15	15	15	15	15	15	15	15	15	15	15	
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27	27	27	27	27	27	27	27	27	27	27	27	27	
28	28	28	28	28	28	28	28	28	28	28	28	28	
29	29	29	29	29	29	29	29	29	29	29	29	29	
30	30	30	30	30	30	30	30	30	30	30	30	30	
31	31	31	31	31	31	31	31	31	31	31	31	31	
32	32	32	32	32	32	32	32	32	32	32	32	32	
33	33	33	33	33	33	33	33	33	33	33	33	33	

FIGURE 14.

(15) FORM C-12 (CRITICALITY, DELAY, PROBABILITY OF OCCURRENCE AND SCHEDULE REPORT)

SORT OPTIONS are as listed below each report heading. You may specify SORT OPTIONS to be utilized and number of copies desired. If it is desired to suppress printing of the portion of the ACTIVITY CRITICALITY REPORT covering activities whose criticality is below a specified percent, enter that CRITICALITY PERCENT in lines 4 and/or 9. A report listing those activities that are delayed for lack of available resources will be automatically printed. Conversely, even though an activity may fail to be executed in all iterations due to Probabilistic and/or Conditional Branch Rules, a report covering this situation will not be printed unless requested on this form.

If an ACTIVITY SCHEDULE TABULATION is requested and no SORT is specified, one complete schedule tabulation will be printed and listed (sorted) according to Activity Code. Additional sorting can be obtained by specifying the keyword "SORT" followed by one or more of the following keyword combinations:

EARLIEST START

EXPECTED START

LATEST START

EARLIEST FINISH

EXPECTED FINISH

LATEST FINISH

The ACTIVITY SCHEDULE GRAPH is presented in order of EARLIEST START TIMES. If multiple pages are printed due to the number of

PROJECT _____
DATE _____

TRANSIM V INPUT DATA SHEET FORMC-12 (CRITICALITY DELAY, PROBABILITY OF OCCURRENCE, AND SCHEDULE REPORTS)

Key punched on this form do NOT punch dots in shaded columns.

(Enter number only if this number differs from previously specified number of copies of output reports to be printed)

PAGE ____ OF ____

		CARD SEQUENCE OR IDENTIFICATION (Optional)	
1	CRITICALITY ANALYSIS	ENTER	YES OR NO
2	ACTIVITY/MILESTONE	CRITICALITY REPORT	REPORT WITH PREDECESSORS ONLY
3	ACTIVITY/MILESTONES WITH OUT OPTIONS	CRITICALITY REPORT	PREDECESSORS MORE ONLY
4	DECREASING CRITICALITY CODE	CRITICALITY REPORT	PRECEDENT OPTIONS NOT DESIRED
5	ACTIVITY/MILESTONE	CRITICALITY REPORT	SUCCESSORS ONLY
6	ACTIVITY/MILESTONES WITH OUT OPTIONS	CRITICALITY REPORT	SUCCESSORS MORE ONLY
7	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT ONLY
8	ACTIVITY/MILESTONES WITH OUT OPTIONS	CRITICALITY REPORT	PERCENT MORE ONLY
9	DECREASING CRITICALITY CODE	CRITICALITY REPORT	PERCENT NOT DESIRED
10	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT ONLY
11	ACTIVITY/MILESTONES WITH OUT OPTIONS	CRITICALITY REPORT	PERCENT MORE ONLY
12	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT NOT DESIRED
13	ACTIVITIES DELAYED FOR ACTIVITIES	AWAITING RESOURCES	PERCENT ONLY
14	ACTIVITIES DELAYED FOR ACTIVITIES	CRITICALITY REPORT	PERCENT ONLY
15	ACTIVITIES DELAYED FOR ACTIVITIES	CRITICALITY REPORT	PERCENT ONLY
16	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT ONLY
17	ACTIVITY/MILESTONES WITH OUT OPTIONS	CRITICALITY REPORT	PERCENT ONLY
18	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT NOT DESIRED
19	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT ONLY
20	ACTIVITY/MILESTONE	CRITICALITY REPORT	PERCENT NOT DESIRED
21	ACTIVITY/MILESTONE	SCHEDULE TABULATION	ENTER YES OR NO
22	ACTIVITY/MILESTONE	SCHEDULE TABULATION	ENTER YES OR NO
23	SORT OPTIONS	SCHEDULE TABULATION	ENTER YES OR NO
24	ACTIVITY/MILESTONE	SCHEDULE TABULATION	ENTER YES OR NO
25	EARLIEST START	SCHEDULE TABULATION	ENTER YES OR NO
26	EXPECTED START	SCHEDULE TABULATION	ENTER YES OR NO
27	LATEST START	SCHEDULE TABULATION	ENTER YES OR NO
28	EARLIEST FINISH	SCHEDULE TABULATION	ENTER YES OR NO
29	EXPECTED FINISH	SCHEDULE TABULATION	ENTER YES OR NO
30	LATEST FINISH	SCHEDULE TABULATION	ENTER YES OR NO
31	ACTIVITY/MILESTONE	SCHEDULE GRAPH	ENTER YES OR NO
32	GRAPH WILL BE SORTED ACCORDING TO EARLIEST START TIMES ONLY	SCHEDULE GRAPH	ENTER YES OR NO
33	ACTIVITY/MILESTONE	DESCRIPTION FOR GRAPH	ENTER YES OR NO

FIGURE 15.

activities and/or the length of the project, they will be designated in the upper right hand corner, as follows:

A1	B1	C1
A2	B2	C2
A3	B3	C3
		etc.

and may be taped together accordingly for presentation purposes. Only one copy of the ACTIVITY SCHEDULE GRAPH and DESCRIPTION FOR GRAPH may be obtained.

(16) FORM C-13A (SCHEDULE TABULATION GRAPH
AND STATUS REPORTS FOR RESPONSIBILITY GRAPH)

Selected ACTIVITY SCHEDULE TABULATION GRAPH and STATUS REPORTS for activities corresponding to one or more RESPONSIBILITY CODES may be specified following the keyword, "RESPONSIBILITY." Enter RESPONSIBILITY CODES for reports required as indicated in instructions on the form.

If a report is desired for each RESPONSIBILITY CODE, simply enter "ALL". If no report is required, leave the blanks unfilled.

Separate ACTIVITY STATUS REPORTS may be obtained for each of the designated responsibilities, covering "ACTIVITIES UNDERWAY," "DUE TO START," and "DUE TO COMPLETE," within the specified time period(s).

(17) FORM C-14 (RESOURCE REPORTS)
Each RESOURCE CODE appearing on this form should have a corresponding entry on FORM C-4A. A given RESOURCE CODE specified should appear only once on FORM-14.

PROJECT _____ DATE _____ PAGE _____

TRANSIM V INPUT DATA SHEET FORM C-12A (SCHEDULE TABULATION GRAPH AND STATUS REPORTS FOR RESPONSIBILITY CODES)

Keypuncher: On this form, do NOT punch data in shaded columns

(*Enter number only if this number differs from previous long and number of copies of output reports to be printed)

Analyst follow instructions below:

1 RESPONSIBILITY CODE(S): (IF REPORTS ARE DESIRED FOR EACH RESPONSIBILITY CODE, ENTER THE WORD "ALL" IN ANY ONE OF THE BLANK SQUARES BELOW. IF NO REPORTS ARE DESIRED, LEAVE THE BLANKS UNFILLED)										2																			
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9 ACTIVITY/MILESTONE SCHEDULE TABULATION (ENTER "YES" OR "NO")										10																			
11 ACTIVITY/MILESTONE CODE										12																			
13 EXPECTED START										14																			
15 EARLIEST FINISH										16																			
17 LATEST FINISH										18																			
19 ACTIVITY/MILESTONE SCHEDULE GRAPH										20																			
21 ACTIVITY/MILESTONE DESCRIPTION FOR GRAPH										22																			
23 STATUS REPORT RESPONSIBILITY CODE(S): (FOLLOW INSTRUCTIONS IN LINE 11)										24																			
25										26																			
27										28																			
29 REPORT PERIOD										DAY		MONTH		YEAR		THROUGH		30											
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TRANSMIV INPUT DATA SHEET FORM C-14 (RESOURCE REPORTS)

Key puncher: On this form, do NOT punch data in shaded columns

* Enter number only if this number differs from previously punched number of copies of output report(s) to be printed

Analyst: follow instructions below

CHARACTER		SEQUENCE		OR IDENTIFICATION	
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FIGURE 17.

By default, if interval width for the RESOURCE GRAPH is not specified, the vertical axis (number of units) will be automatically scaled to the height of a single page. The horizontal axis (workdays, time periods, or calendar dates) will be scaled according to the length of the project and may extend over several pages.

If more than one page is required due to the number of resources and/or length of the project, they will be designated in the upper right hand corner as follows:

A1	B1	C1
A2	B2	C2
A3	B3	C3

These can be taped together accordingly for presentation purposes.

(18) FORM C-15A (RESOURCE SUMMARY REPORTS)

Information listed on FORM C-15A includes the title of the RESOURCE SUMMARY REPORT, specification of those RESOURCE CODES to be added or subtracted, and units in which these items are to be defined.

Resulting reports include an AGGREGATE RESOURCE HISTORY, HISTORY GRAPH, and DESCRIPTION FOR A HISTORY GRAPH.

This form is also used to obtain COST REPORTS for those resources to which a COST RATE is assigned on FORM C-4A.

FIGURE 18.

C. COMPUTER OPERATIONS.

1. Data Deck Structure.

The card deck or input file prepared from the pre-coded forms and submitted to the computer may consist of any number of separate segments, but must always be in the following sequence.

a. Control Cards.

These cards are unique to the particular computer installation. They direct the computer to allocate the necessary requirements (i.e. storage, running time, etc.) to run the package. Control cards convey the following minimum information:

- o Account number.
- o Unique "job" identification and/or sequence number.
- o Machine time and/or output limits (number of lines and/or pages).
- o Identification of the program version to be run.
- o Amount of computer storage to be allocated.

b. TRANSIM V Input Forms.

The remaining information to be "input" into the system for computer identification and analysis are to be taken from the following forms in this sequence only:

C-0, C-1, C-1A, C-2, C-9, C-2A and/or C-2B, C-4A,
C-3A and/or C-3B and/or C-3C, C-10, C-10A, C-11,
C-12, C-13A, C-14, C-15A

For a project involving separate networks, each drawing from a common resource pool, the data forms (C-1, C-1A, C-2 and C-9) for each of these subnetworks must be grouped together and introduced by a card using the following format.

(Cols. 1-7)	(Col. 8)	(Cols. 9-70)
NETWORK	space	TITLE OF NETWORK

As shown above, the keyword* "NETWORK" is followed by a space and then by the "TITLE OF THE NETWORK."

NOTE: For a single network, ignore the above. Specifications of a network name is optional; it will be treated as "NETWORK" by default.

c. Final Card(s).

The final card of the input data deck will include the word "GO." The word can be punched anywhere within Columns 1-72 inclusively.

A "GO" card will permit simulation to proceed if there are no "FATAL" errors found in the input deck.

* A TRANSIM V keyword is any word or set of contiguous characters which is preprinted on the input data forms.

2. How to Estimate Computer Running Time.

The running time for any given network varies widely from one computer installation to another due to inherent differences in the operating characteristics of different computer systems. The best guide to running time for a particular network is therefore a comparison to the time requirements of other networks run at the same computer installation.

In general, the following guidelines apply in all cases:

- o The running time is always made up of three basic segments:

The time to edit the input data

The time to simulate the network

The time to generate the reports

- o The time required for input data editing is roughly proportional to the number of cards comprising the input data deck. The time required for simulation is proportional to the number of activities in the network multiplied by the number of iterations while the time required to generate the reports is roughly proportional to the number of pages of the reports produced.

It should be noted that the most significant factor in determining the running time for all but the smallest networks, is the number of iterations. Therefore, it is generally recommended that the number of iterations be held to 100 or less for all test runs, and increased beyond 100 only where necessary for statistical (sample size) reasons.

In general, it can be stated that for typical networks, the computer time required for editing the input data and generating the reports is roughly equal to one half the time required for 100 iterations. Increasing the number of iterations to 200 would therefore increase the running time by 50 percent.

D. OUTPUT REPORTS AND THEIR USE.

TRANSIM V Output Reports are presented in a variety of formats, as specified on the input data sheets. Examples of each are given in this section.

1. SEQUENCE OF REPORTS.

Regardless of which and how many reports are specified, the TRANSIM V output reports will always appear in the following sequence:

- o List of Names Used in the Model (always printed)
- o Summary of Number of Words Data Storage Used (always printed)
- o Schedule Risk Report
- o Time Summary Graph
- o Criticality Analysis Report
- o Activity Criticality Report
 - With Predecessors, sorted by Activity/Milestone Code and/or Decreasing Criticality
 - With Successors, sorted by Activity/Milestone Code and/or Decreasing Criticality
- o Activities Delayed Awaiting Resources
- o Activity/Milestone Probability of Occurrence Report
- o Activity/Milestone Schedule, sorted by
 - Activity/Milestone Code and/or
 - Earliest Start Times and/or
 - Expected Start Times and/or

- **Latest Start Times**
 and/or
- **Earliest Finish Times**
 and/or
- **Expected Finish Times**
 and/or
- **Latest Finish Times**
- o **Activity Schedule Graph**
- o **Activity Code and Description for Schedule Graph**
- o **Resource Utilization History**
- o **Resource Requirements Graph**
 - **Schedule**
 - **Summary**
- o **Activity Code and Description for Resource Requirements Graph**
- o **Aggregate Resource History**
- o **Aggregate Resource History Graph**
 - **Schedule**
 - **Summary**
- o **Activity Code and Description for Aggregate Resource History Graph**
- o **Cumulative Aggregate Resource History Graph**
- o **Aggregate Resource Summary Graph**
- o **Activity Status Reports**
 - **Activities Underway for Responsibility**
 - **Activities Due to Start**
 - **Activities Due to Complete**

2. LIST OF NAMES USED IN THE MODEL.

All TRANSIM V output defines the type of entities used in the model to be analyzed. These may include:

- o Operating Element
- o Traffic Unit Type
- o Table Name
- o Rule Name
- o Group Code
- o Activity Code
- o Resource Code
- o Responsibility Code

Names are listed and the appropriate column is checked. More than one column may be checked; for example, the same NAME may be used for both an Activity and a Table Name (See Figure 19).

3. SUMMARY OF USED DATA STORAGE.

This section summarizes the actual usage of computer storage. It may be used to estimate internal data storage requirements as specified in TRANSIM V Input Data FORM C-0 (See Figure 20).

4. SCHEDULE RISK REPORT.

The SCHEDULE RISK REPORT (See Figure 21) lists the probability that each specified activity will meet its Approved Schedule Date. The report lists Activity/Milestone Codes and Descriptions along with corresponding Percent Criticality and Lead Responsibility.

For example, a 5% probable level of risk is entered in the Acceptable Risk Level column. The computer reports the date that meets this level of acceptable risk, and in the next column (Deficit or

BOILER REPAIR MODEL (114F01771)	
LIST OF NAMES USED IN THIS MODEL	
NAME	USE C F Q R
OPERATING TRAFFIC TABLE FUSE GROUP ACTIVITY RESOURCE RESPONSIBILITY	
ELEMENT	UNITY TYPE NAME CODE
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
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86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
00	
01	YARD
02	SHOP-45
03	SHOP-44
04	SHOP-43
05	SHOP-42
06	SHOP-41

Figure 19. List of Names Used in This Model.

BOILER REPAIR MODEL ----- 29SEP77

PAGE

THE MAXIMUM NUMBER OF WORDS DATA STORAGE USED WAS 17179 OUT OF AN AVAILABLE 35328 WORDS.
AT PRESENT 366 WORDS USED FOR THE LIST OF NAMES.
174 WORDS USED FOR SERVICE TIME TABLES.
0 WORDS USED FOR SUMMARY REPORT INDEXING.
0 WORDS USED FOR SUMMARY REPORT WORKING AREA.
1213 WORDS USED FOR ACTIVITIES.
230 WORDS USED FOR RESPONSIBILITIES.
168 WORDS USED FOR RESOURCE POOLS.
826 WORDS USED FOR RESOURCE UTILIZATION REPORTS.
279 WORDS USED FOR RISK REPORTS.
1137 WORDS USED FOR TIME SUMMARY GRAPHS.
25 WORDS USED FOR DELAY REPORTS (ACTIVITIES DELAYED AWAITING RESOURCES).
0 WORDS USED FOR SUMMARY REPORT EVENT NOTICES.
0 WORDS USED FOR SUMMARY REPORT DISTRIBUTIONS.
0 WORDS USED FOR LOAD SUMMARY REPORT DISTRIBUTIONS.
0 WORDS USED FOR TIME SUMMARY REPORT DISTRIBUTIONS.
THIS IS NOT A COMPLETE LISTING OF ALL THE DATA STORAGE USED.

END OF SIMULATOR OUTPUT. MESSAGES OF FOLLOWING PAGES ARE PRINTED BY THE OPERATING SYSTEM OF THIS COMPUTER INSTALLATION.

Figure 20. Summary of Number of Words Data Storage Used.

BOILER REPAIR MODEL (14FEB77)

DEFICIENCY = THE DATE OF PAST RUN - THE DATE OF PREVIOUS RUN LEVEL IS REACHED

THE JOURNAL OF CLIMATE

THE PRACTICAL TEACHER, OCTOBER 1891.

CODE	DESCRIPTION	ACTIVITY / MILESTONE		APPROVED SCHEDULE:		ACCEPTABLE RISK:		DEFICIT RISK:		PROB OF ACCEPT:		MEETINg DATE:		SINCE LAST R:	
		PERCENT	LEAD	DATE	PROB OF	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE	MEETING DATE
1.2	FINISH REPAIR BUTLER UTIGE CASTING	47	YARD	1C 19MAY77	30	5 P 28JUN77	27	5 P 21JUN77	21	5 P 14JUN77	14	5 P 7JUN77	7	5 P 1JUN77	1
1.3	REMOVE SHELF AND INSTALL STUC TUBES	8	YARD	1B 25MAY77	92	5 P 20MAY77	92	5 P 13MAY77	13	5 P 6MAY77	6	5 P 29MAY77	29	5 P 22MAY77	22
1.5	REMOVE PREP AND INSTALL ECONOMIZE TUBES	8	YARD	1C 12MAY77	59	5 P 10MAY77	59	5 P 3MAY77	3	5 P 27MAY77	27	5 P 20MAY77	20	5 P 13MAY77	13
1.6	RE-INSTALL UPUM INTERNALS	4	YARD	1C 22MAY77	100	5 P 27APR77	100	5 P 20APR77	20	5 P 13APR77	13	5 P 6APR77	6	5 P 27MAY77	27
2.6	INSTALL PLASTIC MFG FACTORY	3.4	YARD	1C 10FEB77	0	5 P 16JUN77	0	5 P 9JUN77	0	5 P 2JUN77	0	5 P 19JUN77	0	5 P 12JUN77	0
2.8	INSTALL PLASTIC MFG FACTORY	4.5	YARD	1C 10FEB77	0	5 P 16JUN77	0	5 P 9JUN77	0	5 P 2JUN77	0	5 P 19JUN77	0	5 P 12JUN77	0
2.9	INSTALL PLASTIC MFG FACTORY	1.0	YARD	1M 27MAY77	56	5 P 2JUN77	56	5 P 25MAY77	25	5 P 18MAY77	18	5 P 11MAY77	11	5 P 4MAY77	4
2.9	INSTALL PLASTIC MFG FACTORY	1.0	YARD	1M 27MAY77	0	5 P 2JUN77	0	5 P 25MAY77	0	5 P 18MAY77	0	5 P 11MAY77	0	5 P 4MAY77	0

Figure 21. Schedule Risk Report.

Surplus Workdays), lists the number of days ("+" (surplus) = the date of meeting acceptable risk level earlier than Approved Schedule Date; "-" (deficit) = the date of meeting acceptable risk level is later than the Approved Schedule Date) between the Acceptable Risk Date and the Approved Schedule Date.

If the report has been updated, another section consisting of an additional three columns is created. These columns list the differences between the current and previous runs, with respect to the probability of meeting the Approved Schedule Date, the DEFICIT or SURPLUS Workdays, and activity criticality.

5. TIME SUMMARY GRAPH.

The TIME SUMMARY GRAPH (See Figure 22) can be obtained for overall project time as well as for the start and/or finish times of a specific activity, or for the elapsed time between activities.

Distributions are automatically scaled to fit a single page if these specifications are not given. If they are, the computer will use as many pages as it required to meet the specifications.

6. CRITICALITY ANALYSIS REPORT.

The CRITICALITY ANALYSIS REPORT (See Figure 23) simply lists the number of activities/milestones in decreasing order of criticality. A Criticality Distribution of the total number of activities/milestones in increments of 10 percentiles starting from zero percentile (which identifies noncritical activities/milestones) is printed.

TIME SUMMARY GRAPH		DATE TO COMPLETE*		PIPELINE* *TWO ROUTES*	
TIMES OF MILESTONE 92ELKPIN		FINISH OF ELK HILLS PROJECT		X = PERCENT PROBABILITY (ROUNDED)	
LATEST DATE : 18 FEB 80		EXPECTED DATE : 1 OCT 79		C = CUMULATIVE PERCENT PROBABILITY	
EARLIEST DATE : 14 MAY 79					
INTERVAL	DATE	DATE	DATE	DATE	DATE
13 MAY 79 OR EARLIER					
14 MAY 79	14 MAY 79	14 MAY 79	14 MAY 79	14 MAY 79	14 MAY 79
23 MAY 79	15 MAY 79	16 MAY 79	17 MAY 79	18 MAY 79	19 MAY 79
1 JUN 79	16 JUN 79	17 JUN 79	18 JUN 79	19 JUN 79	20 JUN 79
10 JUN 79	17 JUN 79	18 JUN 79	19 JUN 79	20 JUN 79	21 JUN 79
19 JUN 79	18 JUN 79	19 JUN 79	20 JUN 79	21 JUN 79	22 JUN 79
28 JUN 79	17 JUN 79	18 JUN 79	19 JUN 79	20 JUN 79	21 JUN 79
7 JUL 79	16 JUL 79	17 JUL 79	18 JUL 79	19 JUL 79	20 JUL 79
16 JUL 79	15 JUL 79	16 JUL 79	17 JUL 79	18 JUL 79	19 JUL 79
25 JUL 79	14 JUL 79	15 JUL 79	16 JUL 79	17 JUL 79	18 JUL 79
3 AUG 79	13 AUG 79	14 AUG 79	15 AUG 79	16 AUG 79	17 AUG 79
12 AUG 79	14 AUG 79	15 AUG 79	16 AUG 79	17 AUG 79	18 AUG 79
21 AUG 79	13 AUG 79	14 AUG 79	15 AUG 79	16 AUG 79	17 AUG 79
30 AUG 79	12 AUG 79	13 AUG 79	14 AUG 79	15 AUG 79	16 AUG 79
9 SEP 79	18 SEP 79	19 SEP 79	20 SEP 79	21 SEP 79	22 SEP 79
17 SEP 79	17 SEP 79	18 SEP 79	19 SEP 79	20 SEP 79	21 SEP 79
26 SEP 79	16 SEP 79	17 SEP 79	18 SEP 79	19 SEP 79	20 SEP 79
5 OCT 79	15 OCT 79	16 OCT 79	17 OCT 79	18 OCT 79	19 OCT 79
14 OCT 79	14 OCT 79	15 OCT 79	16 OCT 79	17 OCT 79	18 OCT 79
23 OCT 79	13 OCT 79	14 OCT 79	15 OCT 79	16 OCT 79	17 OCT 79
1 NOV 79	19 NOV 79	20 NOV 79	21 NOV 79	22 NOV 79	23 NOV 79
10 NOV 79	18 NOV 79	19 NOV 79	20 NOV 79	21 NOV 79	22 NOV 79
19 NOV 79	17 NOV 79	18 NOV 79	19 NOV 79	20 NOV 79	21 NOV 79
28 NOV 79	16 NOV 79	17 NOV 79	18 NOV 79	19 NOV 79	20 NOV 79
7 DEC 79	15 DEC 79	16 DEC 79	17 DEC 79	18 DEC 79	19 DEC 79
16 DEC 79	14 DEC 79	15 DEC 79	16 DEC 79	17 DEC 79	18 DEC 79
25 DEC 79	13 DEC 79	14 DEC 79	15 DEC 79	16 DEC 79	17 DEC 79
3 JAN 80	12 JAN 80	13 JAN 80	14 JAN 80	15 JAN 80	16 JAN 80
12 JAN 80	11 JAN 80	12 JAN 80	13 JAN 80	14 JAN 80	15 JAN 80
21 JAN 80	10 JAN 80	11 JAN 80	12 JAN 80	13 JAN 80	14 JAN 80
30 JAN 80	9 JAN 80	10 JAN 80	11 JAN 80	12 JAN 80	13 JAN 80
8 FEB 80	18 FEB 80	19 FEB 80	20 FEB 80	21 FEB 80	22 FEB 80
17 FEB 80	17 FEB 80	18 FEB 80	19 FEB 80	20 FEB 80	21 FEB 80
LATER THAN					
					25 FEB 80

Figure 22. Time Summary Graph.

BOILER REPAIR TEST DATA 25AUG77
 CRITICALITY ANALYSIS REPORT

(COMPLETED ACTIVITIES/MILESTONES ARE EXCLUDED FROM THIS REPORT)

TOTAL NUMBER OF ACTIVITIES/MILESTONES : 26
 NUMBER OF CRITICAL ACTIVITIES/MILESTONES : 21 (81 PERCENT)

CRITICALITY PERCENT	NUMBER OF ACTIVITIES/MILESTONES	PERCENT OF TOTAL
91 THRU 100	2	8
81 THRU 90	0	0
71 THRU 80	0	0
61 THRU 70	1	4
51 THRU 60	5	19
41 THRU 50	0	0
31 THRU 40	2	8
21 THRU 30	0	0
11 THRU 20	5	19
1 THRU 10	6	23
	5	19
	0	

Figure 23. Criticality Analysis Report.

Additional information listed on this report is as follows:

- o Total Number of Activities/Milestones
- o Number of Critical Activities/Milestones
(along with percent critical)

7. ACTIVITY CRITICALITY REPORT.

The ACTIVITY CRITICALITY REPORT describes the criticality of an activity in the given network. Criticality of an activity is the percent probability that the given activity will be on the Critical Path --defined as the sequence of activities that takes the longest time from Starting Activity to Finish Activity.

The ACTIVITY CRITICALITY REPORT may be obtained with either Pre-decessor or Successor Activities. The report may be sorted either by (1) Activity/Milestone Code, or (2) By Decreasing Criticality. Figure 24 is an Activity Criticality Report with Predecessors--Listed According to Decreasing Criticality.

ACTIVITY STATUS is coded as follows:

- "*" indicating a Completed Activity, or
- "+" indicating an Underway Activity.

These indicators are printed in front of the relevant Activity Description.

ACTIVITY CODES and DESCRIPTIONS of the specified activity and its Predecessor(s) or Successor(s) Activity(ies) are listed with their corresponding Criticality Percent. Activity Expected Slack Time (in Workdays), is listed for the Predecessor or Successor to which it corresponds. More than one report may be printed.

- ERECTION SEQ. SCH. COLOR-A001(M=M, L=LKF/LY, 2*E878

ACTIVITY CRITICALITY REPORT WITH PREDECESSORS (LISTED ACCORDING TO DECREASING CRITICALITY)

ACTIVITY	DESCRIPTION	CRITICALITY (PERCENT)	PRECEESSOR ACTIVITIES	DESCRIPTION	CRITICALITY (PERCENT)	EXPECTED SLACK (WORKDAYS)	
04908984	START BUILDERS TRIALS	PM-048	100	31199049 42399049 84300049	COMP LTG SYS COMP NAV-LEX-ORD OPER TSTG INCLINING	PM-045 PM-044 PM-047	0 0 100 0.0
04909980	COMP ACCEPTANCE TRIALS	PM-049	100	98202049	ACCEPTANCE TRIALS		100
04910813	DELIVERY	PM-050	100	99999049	PRE-OUTFITTING DELIVERY		100
05199987	FINAL PAINT ALL AREAS		100	99702631	2ND DRYDOCK	PM-043	100
01306000	COMP SCHEDULED EVENT 1979-1980		100	04910813	DELIVERY	PM-050	100
05106049	INCLINING	PM-047	100	98205983	FUEL SHIP		100
98201997	DOCK TRIALS	PM-042	100	19999982	COMP AIR TESTING FINAL		103.46
				20999982	EQUIP REMOVAL & REPLACEMENT DEMO		0
				32199982	COMP PWR DISTR SYS	PM-039	4
				43199982	COMP IC SYS	PM-040	7
				50155982	FINAL INST MISC PPG ST 2-5	0	14.00
				51199982	COMP A-C SYS	0	11.75
				52199982	FIREMEN SYS ALL AREA OPER TST	PM-041	0
				98406982	STAGE 6 DOCKSIDE TESTING		40.13
						20	6.04
						0	90.08
						59	2.46
98202049	ACCEPTANCE TRIALS		100	98407982	STAGE 7 TESTING ALL SYS		100
98205983	FUEL SHIP		100	99499982	CLEAN SHIP FOR INCLINING		100
98407982	STAGE 7 TESTING ALL SYS		100	04908984	START BUILDERS TRIALS	PM-048	100
98999049	PRE-OUTFITTING DELIVERY		100	04909989	COMP ACCEPTANCE TRIALS	PM-049	100
99499982	CLEAN SHIP FOR INCLINING		100	99720994	UNDOCK	PM-046	100
99702631	2ND DRYDOCK	PM-043	100	998201997	DOCK TRIALS	PM-042	100
99720994	UNDOCK	PM-046	100	63199997	FINAL PAINT ALL AREAS		100
04905999	LAUNCH	PM-019	97	04904049	COMP HULL ASSEMBLY	PM-017	10
				11401049	16T TGT TEST UNDTR APNDGS		5.21
				19790049	LAUNCH READINESS TSTG		0
				41611049	ALIGNBORN RUDDER-INST CLSG PL		155.04
				52150049	INST SHFT LOCK&COMP PRE-LAUNCHPM-018		22
						65	11.29
							1.54

Figure 24. Activity Criticality Report (with Predecessor--Listed According to Decreasing Criticality).

8. ACTIVITIES DELAYED AWAITING RESOURCES.

This report (See Figure 25) lists those activities (by Code and Description) with corresponding criticality (percent), delay time (workdays or specified time units), Awaiting Availability of All Resources (minimum, expected, and maximum), and Total Resource Requirements (code and number required).

Activity Status is indicated by "*" for Completed; "+" for Underway.

9. ACTIVITY/MILESTONE PROBABILITY OF OCCURRENCE REPORT.

This report (See Figure 26) lists by Code and Description those Activities/Milestones with more than zero percent probability of occurrence. Corresponding Percent Criticality and Probability of Occurrence are listed after their Activity/Milestone Code in one of two columns: 100 Percent and Less Than 100 Percent.

10. ACTIVITY/MILESTONE SCHEDULE.

The ACTIVITY/MILESTONE SCHEDULE (See Figure 27) can be listed according to seven different sorts. These are:

- o Activity/Milestone Codes
- o Earliest Start Times
- o Expected Start Times
- o Latest Start Times
- o Earliest Finish Times
- o Expected Finish Times
- o Latest Finish Times

More than one report may be printed. The user may want an Activity/Milestone Schedule printed according to more than one sort.

RUN (JGI): TRANSIM - LOT 11 08 JUL 76

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ACTIVITIES DELAYED AWAITING RESOURCES (LISTED ACCORDING TO ACTIVITY CODE)
 (•• AVERAGE DAILY RESOURCE UNITS REQUIRED.)

(CONTINUED)

ACTIVITY CODE	ACTIVITY DESCRIPTION	CRITICALITY (PERCENT)	DELAY TIME (WORKDAYS)		TOTAL RESOURCE REQUIREMENTS (CODE)
			AWAITING ALL RESOURCES (MIN)	AWAITING ALL RESOURCES (MAX)	
63807G07	REMOVE DECK GRATING	20	0.08	4.04	22.92
63807G08	REMOVE DECK GRATING	5	0.54	2.38	9.63
63807G09	INSTALL REEFER PLANTS	0	0.0	3.17	14.50
63808G03	REMOVE GRATING DECK	0	0.0	3.38	10.50
63808G04	REMOVE GRATING DECK	0	0.0	2.50	7.75
63808G05	REMOVE GRATING DECK	5	0.25	2.50	7.04
63808G07	REMOVE OVERHEAD GRATING	10	0.09	3.38	9.71
63808G08	REMOVE OVERHEAD GRATING	39	0.34	4.29	21.63
63808G09	INSTALL REFRID PIPING	0	0.0	0.96	3.08
63809G03	REMOVE GRATING OVERHEAD	5	0.0	2.42	7.75
63809G04	REMOVE GRATING OVERHEAD	0	0.0	1.92	6.63
63809G05	REMOVE GRATING OVERHEAD	0	0.0	2.71	15.13
63809G07	REMOVE BULKHEADS	30	0.0	0.21	0.68
63809G08	REMOVE BULKHEAD	35	0.0	0.29	1.58
63809G09	INSTALL LIGHTING	0	0.0	0.75	3.50
63810G07	HOOD DUCTS	10	0.0	0.25	0.67
63810G08	HOOD DUCTS	15	0.0	0.25	0.96
63810G09	CHARGE PIPING	0	0.0	0.33	1.67
63811G03	REMOVE INSULATION DECK	0	0.0	0.42	1.47
63811G04	REMOVE INSULATION DECK	0	0.0	0.71	2.42

Figure 25. Activities Delayed Awaiting Resources (Listed According to Activity Code).

ACTIVITY / MILESTONE				PROBABILITY OF OCCURRENCE		
CODE	DESCRIPTION	PERCENT CRITICAL	100 PERCENT	LESS THAN 100 PERCENT	TOO PERCENT	
01	START	1.00	100	100	100	
02	REMOVE BOILER BILGE CASING	24	100	100	100	
03	REMOVE AIR REGISTERS	15	100	100	100	
04	INITIAL HYDROSTATIC TEST	61	100	100	100	
05	REPAIR BOILER SLIDING SEAT	13	100	100	100	
06	INSPECT BOILER SLIDING SEAT	1.1	100	100	100	
07	CLEAN REPAIR AIR REGISTER ASSEMBLY	0.1	100	100	100	
08	REMOVE REFRACATORY MATERIAL	76	100	100	100	
09	REMOVE OILUM TERMINALS	0	100	100	100	
10	REPAIR BOILER SLIDING SEAT	1.1	100	100	100	
11	EXPLORATION TRAY, OIL	46	100	100	100	
12	FINISH REPAIR BOILER BILGE CASING	24	100	100	100	
13	REPAIR BILGE CASING GENERATING TUBES	36	100	100	100	
14	REMOVE FIBER AND INSTALL SUPPORT TUBES	44	100	100	100	
15	REMOVE SUPPORT TUBES AND INSTALL SUPPORT TUBES	44	100	100	100	
16	REMOVE SUPPORT TUBES AND INSTALL SUPPORT TUBES	44	100	100	100	
17	REMOVE FIBER AND INSTALL SUPPORT TUBES	44	100	100	100	
18	REPAIR BOILER SLIDING SEAT	1.1	100	100	100	
19	REPAIR BOILER SLIDING SEAT	0	100	100	100	
20	REPAIR BILGE CASING	20	100	100	100	
21	REBRICK	20	100	100	100	
22	CERAMICALLY CLEAN TURBINE	39	100	100	100	
23	PRELIMINARY HYDROSTATIC TEST	39	100	100	100	
24	INSTALL AIR REGISTERS	20	100	100	100	
25	INSTALL AIR TERMINALS	39	100	100	100	
26	FINAL HYDROSTATIC TEST	39	100	100	100	
27	INSTALL PLASTIC REFRAC	59	100	100	100	
28	END	100	100	100	100	

Figure 26. Activity/Milestone Probability of Occurrence Report (Listed According to Activity/Milestone Code).

MANAGEMENT LEVEL NET (NO RESOURCE CONSTRAINT) 2 AUG 77

ACTIVITY STATUS : * COMPLETE * UNDERWAY

Figure 27. Activity/Milestone Schedule (Listed According to Earliest Start Times).

11. ACTIVITY SCHEDULE GRAPH.

The ACTIVITY SCHEDULE GRAPH includes all of the activities in the network (See Figure 28).

Activity Code and Percent Criticality are listed down the page. Activity Schedule Time Duration is indicated on the GRAPH by the following notation:

*** = Actual Duration of Completed Activities

XXX = Expected Activity Duration

+++ = Completed Portion of Underway Activities

--- = Range from Earliest Start to Latest Finish

C = Activity Duration Extends into Adjacent Pages

S = Scheduled Start Date

F = Scheduled Finish Date

12. ACTIVITY CODE AND DESCRIPTION FOR SCHEDULE GRAPH.

The ACTIVITY CODE AND DESCRIPTION FOR SCHEDULE GRAPH is a listing of all activities in the Schedule Graph, together with their corresponding Description and Criticality (See Figure 29). One may correlate codes between this report and the graph to identify the activity whose worktime duration is charted on the graph.

13. RESOURCE UTILIZATION HISTORY.

The RESOURCE UTILIZATION HISTORY lists all of the utilization of each specified resource. (See Figure 30).

This REPORT is broken down into four basic columns. These are: Period Ending (ending date of each time period), Resource Unit Hours Utilized by All Activities, Resource Unit Workdays Utilized by All Activities, and Daily--Resource Units. Each of the above is further subdivided into subheaded columns.

MANAGEMENT LEVEL NET (NO RESOURCE CONSTRAINT) 20AUG77

ACTIVITY SCHEDULE GRAPH

TIME PERIOD = 1 WEEK(5)

see = ACTUAL DURATION OF COMPLETED ACTIVITIES
 XXX = EXPECTED ACTIVITY DURATION
 C = ACTIVITY DURATION EXTENDS INTO ADJACENT PAGES

FROM DEC 76 THRU NOV 78

PERIOD ENDING : 7 7

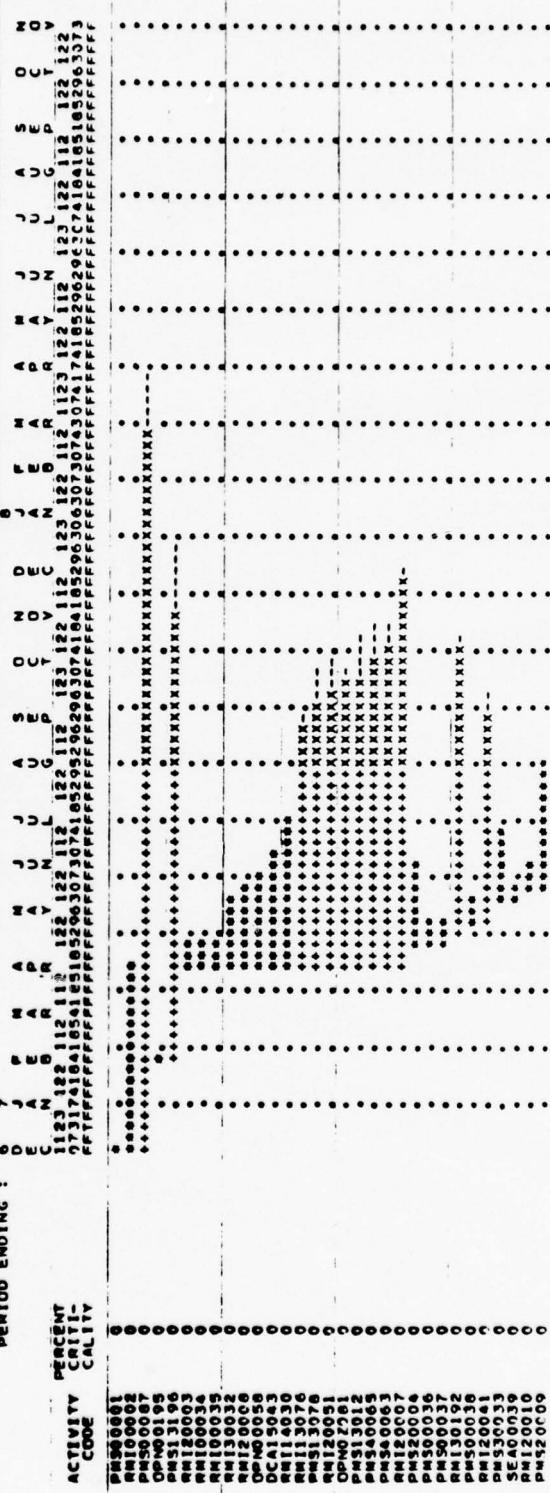


Figure 28. Activity Schedule Graph.

MANAGEMENT LEVEL NET (NO RESOURCE CONSTRAINT) 24AUG77

APPENDIX A
COSTS AND SCHEDULES FOR THE PROPOSED
PROJECT

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ACTIVITY CODE	ACTIVITY DESCRIPTION	CRITICALITY (PERCENT)	ACTIVITY CODE	ACTIVITY DESCRIPTION	CRITICALITY (PERCENT)
PMS00067	REVIEW ENGINE OPTIONS	2	PMS00071	REVIEW ENGINE OPTIONS	2
PMS13078	UPDATE APP DRAFT 3K SES SHAP	2	PMS13078	UPDATE APP	2
PMS13012	PREPARE ROUGH DRAFT 3K SES SHAP	2	PMS13012	PREPARE ROUGH DRAFT 3K SES SHAP	2
PMS40055	PREPARE C/S SOFTWARE MANAGEMENT PLAN	2	PMS40055	PREPARE C/S SOFTWARE MANAGEMENT PLAN	2
PMS40053	PREPARE COMBAT SYSTEM MANAGEMENT PLAN	2	PMS40053	PREPARE COMBAT SYSTEM MANAGEMENT PLAN	2
PMS20044	PREPARE C/S SOFTWARE MANAGEMENT PLAN	2	PMS20044	PREPARE C/S SOFTWARE MANAGEMENT PLAN	2
PMS00036	REVIEW SOW M/H	2	PMS00036	REVIEW AND APPROVE 100A MODEL PLAN	2
PMS00037	REVIEW REVISED ENGINEERING PLAN	2	PMS00037	REVIEW SOW M/H	2
PMS00038	PREPARE TAR	2	PMS00038	REVIEW REVISED ENGINEERING PLAN	2
PMS50033	REV AND INCORPORATE CDRL E012 IN SHAP	2	PMS50033	PREPARE TAR	2
PMS50032	REV AND INCORPORATE CDRL E012 IN SHAP	2	PMS50032	REV AND INCORPORATE CDRL E012 IN SHAP	2
PMS50032	REVIEW 100A MODIFICATION PLAN	2	PMS50032	REVIEW 100A MODIFICATION PLAN	2
PMS50032	CONDUCT 1ST QPR	2	PMS50032	CONDUCT 1ST QPR	2
PMS40060	INCORP. C/S DECISION TLR, PM4, SOW (W)	2	PMS40060	INCORP. C/S DECISION TLR, PM4, SOW (W)	2
PMS13077	REV AND INCORP. CDRL E001 IN SHAP	2	PMS13077	REV AND INCORP. CDRL E001 IN SHAP	2
PMS20042	REV AND INCORPORATE ENGR PLAN IN SHAP	2	PMS20042	REV AND INCORPORATE ENGR PLAN IN SHAP	2
PMS40042	REV AND INCORPORATE ENGR PLAN IN SHAP	2	PMS40042	REV AND INCORPORATE ENGR PLAN IN SHAP	2
PMS40042	REV AND INCORPORATE ENGR PLAN IN SHAP	2	PMS40042	REV AND INCORPORATE ENGR PLAN IN SHAP	2
PMS30015	NEGOVATE WNSUP FOR ON-SITE SUPPORT	2	PMS30015	NEGOVATE WNSUP FOR ON-SITE SUPPORT	2
PMS30015	NEGOVATE WNSUP FOR SLMP PREP	2	PMS30015	NEGOVATE WNSUP FOR SLMP PREP	2
PMS30017	NEGOVATE WNSUP FOR LOGISTICS SUPPORT	2	PMS30017	NEGOVATE WNSUP FOR LOGISTICS SUPPORT	2
PMS40019	NEGOVATE WNSUP FOR COMB SYS SUPPORT	2	PMS40019	NEGOVATE WNSUP FOR COMB SYS SUPPORT	2
PMS40019	NEGOVATE WNSUP FOR ELECTRICAL SUPPORT	2	PMS40019	NEGOVATE WNSUP FOR ELECTRICAL SUPPORT	2
PMS40021	NEGOVATE WNSUP FOR TEST SITE SUPPORT	2	PMS40021	NEGOVATE WNSUP FOR TEST SITE SUPPORT	2
PMS50022	NEGOVATE WNSUP FOR C/S CONTR DESIGN	2	PMS50022	NEGOVATE WNSUP FOR C/S CONTR DESIGN	2
PMS40022	NEGOVATE WNSUP FOR C/S CONTR DESIGN	2	PMS40022	NEGOVATE WNSUP FOR C/S CONTR DESIGN	2
PMS00064	SUBMIT CSM FOR REVIEW	2	PMS00064	NEGOVATE WNSUP FOR C/S CONTR DESIGN	2
PMS00065	REV CSM OF C/S MANAGEMENT PLAN	2	PMS00065	NEGOVATE WNSUP FOR C/S CONTR DESIGN	2
PMS13022	INCORPORATE SPD/MAINT SHAP	2	PMS13022	INCORPORATE SPD/MAINT SHAP	2
PMS20046	REV 100A MODEL TEST PROGRAM	2	PMS20046	REV 100A MODEL TEST PROGRAM	2
PMS40057	COORDINATE C/S MANAGEMENT PLANS //PARMS	2	PMS40057	COORDINATE C/S MANAGEMENT PLANS //PARMS	2
PMS40062	PREPARE COMBAT SYSTEMS REQUIREMENTS	2	PMS40062	PREPARE COMBAT SYSTEMS REQUIREMENTS	2

Figure 29. Activity Code and Description for Schedule Graph.

Period Ending (Date). Lists ending date of specified time period. Also code following indicates: "*" = Actual Utilization for the time period; "+" = Sum of actual plus remaining Projected Utilization for this time period.

Resource Unit Hours Utilized by All Activities. Lists Minimum, Expected, and Maximum Projected Utilization. Actual Utilization is listed under the Expected Column.

NOTE: The hours given are determined by multiplying Resource Unit Workdays by the number of Hours in a Working Day (see FORM C-10). Each figure (i.e. Minimum, Expected, and Maximum) is calculated in the same way.

Resource Unit Workdays Utilized by All Activities. Actual Utilization is listed under the Expected Column.

An additional column, Cumulative (Expected), provides the user with a Summation of Expected values.

Daily--Resource Units. Resource Units Required by Activity with Highest Demand (UNITS) is shown, together with Maximum Requirements (UNITS). Also listed are the Available Resource (UNITS) and Expected Percent Utilization of Available Resources.

TOTALS (not in example figure) listed at the end of the report include: Total Expected Resource Unit Hours Utilization; Total Expected Resource Unit Workdays Utilization; Overall Resource Units Expected Utilization (based on Resources Available).

14. RESOURCE REQUIREMENTS GRAPH.

The RESOURCE REQUIREMENTS GRAPH consists of two sections.

a. Schedule Section (See Figure 31).

The first section lists Activity Code, Percent Criticality, and Average Daily Resource Units Required. It charts the following:

*** = Actual Duration of Completed Activities

XXX = Expected Activity Duration

+++ = Completed Portion of Underway Activities

--- = Range from Earliest Start to Latest Finish

C = Activity Duration Extends to Adjacent Pages

b. Summary Section (See Figure 32).

This section presents graphically the additive requirements of all of the activities listed in the foregoing section (i.e., all of the activities utilizing the particular resource, for each workday or time period).

15. ACTIVITY CODE AND DESCRIPTION FOR RESOURCE REQUIREMENTS

GRAPH. This report is similar in content and format to Figure 29: Activity Code and Description for Schedule Graph. As in Figure 29, Activity Codes and Descriptions with their corresponding Criticality Percents is listed on this report.

MANAGEMENT LEVEL NET (NO RESOURCE CONSTRAINT) 24AUG77

RE SOURCE REQUIREMENTS GRAPH

RESOURCE CODE : PNS304 MEN
NUMBER OF RESOURCE UNITS AVAILABLE : 10006.00

TIME PERIOD = 1 WEEK(S)

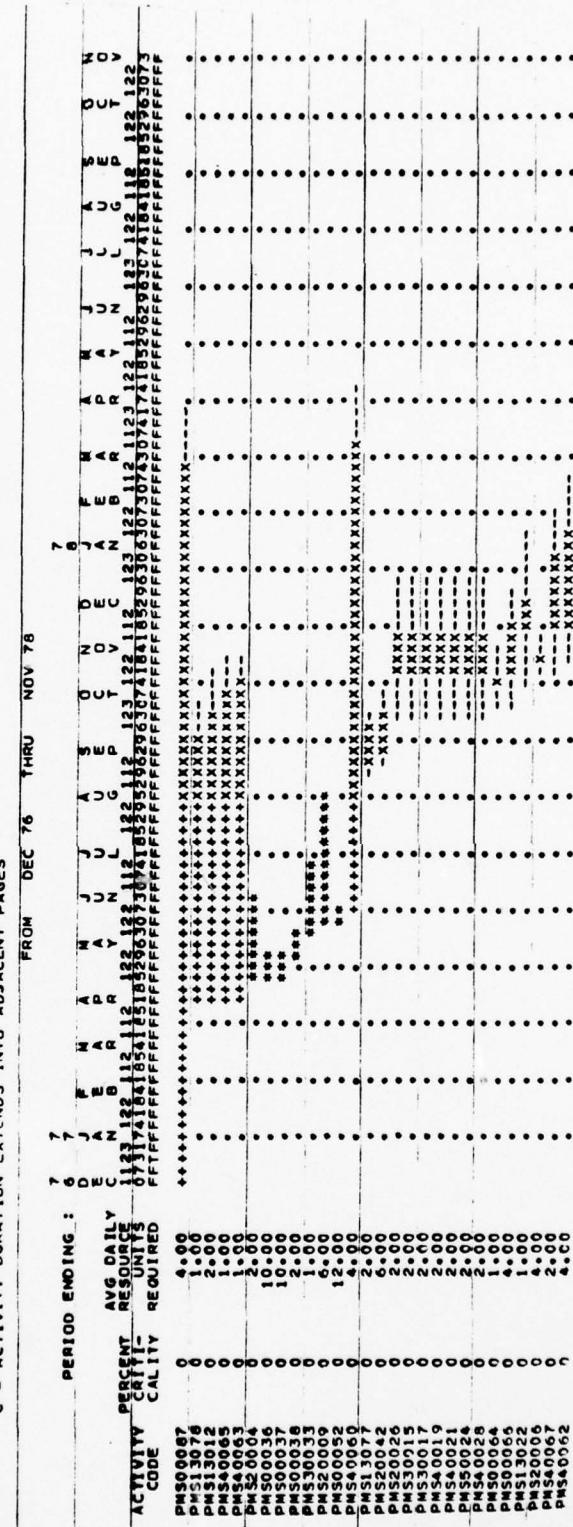
*** = ACTUAL DURATION OF COMPLETED ACTIVITIES
XXX = EXPECTED ACTIVITY DURATION

C = ACTIVITY DURATION EXTENDS INTO ADJACENT PAGES

PAGE 106

SHEET 4 1

*** = COMPLETED PORTION OF UNDERWAY ACTIVITIES
--- = RANGE FROM EARLIEST START TO LATEST FINISH



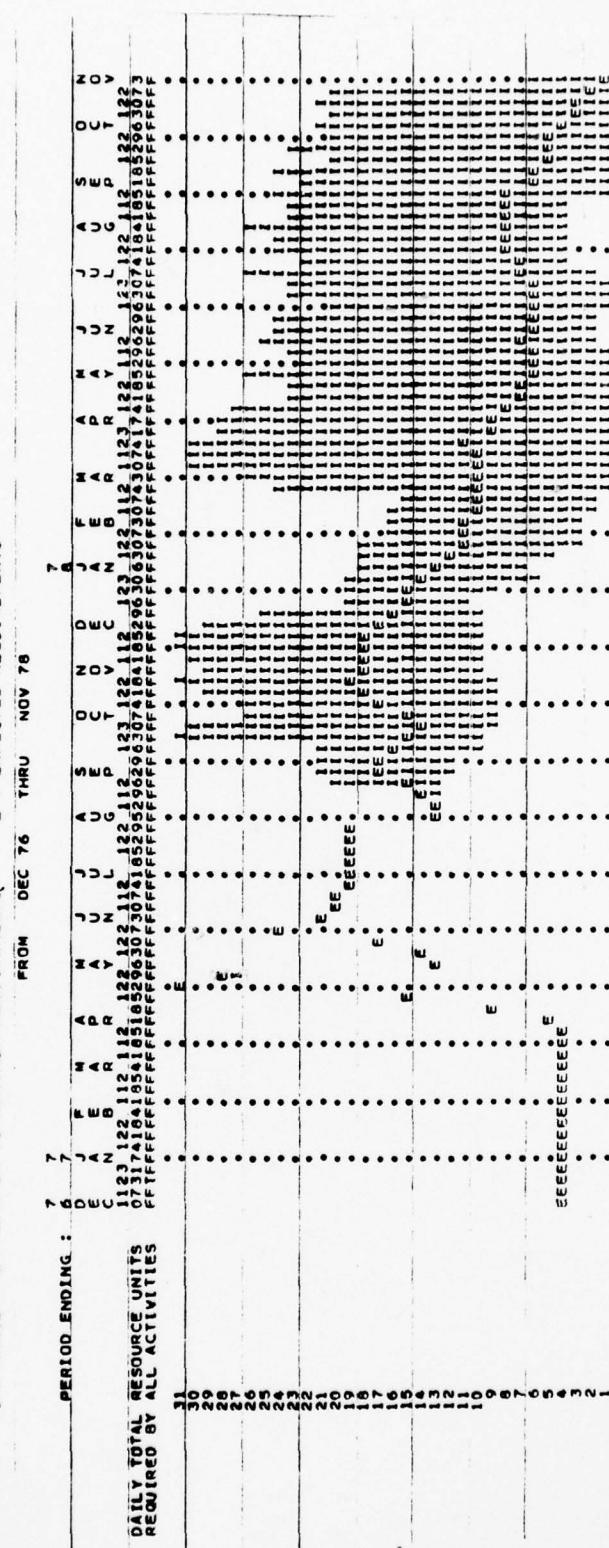
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Figure 31. Resource Requirements Graph (Schedule).

MANAGEMENT LEVEL NET (NO RESOURCE CONSTRAINT) 24AUG77
 RESOURCE REQUIREMENTS GRAPH
 RESOURCE CODE : MEN (CONTINUED)

DESCRIPTION : PMS104 MEN
 NUMBER OF RESOURCE UNITS AVAILABLE : 10000.00

I = RANGE FROM MAXIMUM TO MINIMUM REQUIREMENTS, E = EXPECTED REQUIREMENTS



16. AGGREGATE RESOURCE REPORTS.

AGGREGATE RESOURCE REPORTS are similar to the previously mentioned Resource Reports except that as denoted by the word, "aggregate," these reports show results of a combination of two or more activity resources. Figures 33 is similar to the previously mentioned Resource Utilization History (See Section 13) and Figures 34 and 35 are similar to the previously mentioned Resource History Graphs (See Section 14). Note here that "history" and "requirements" are used interchangeably. Not shown, but possible to retrieve is a report on Activity Code and Description for Aggregate... which is similar to other Activity Code and Description... reports (See Section 12).

Additional reports are as follows:

a. CUMULATIVE AGGREGATE RESOURCE HISTORY GRAPH (See Figure 36).

This report presents the information in terms of cumulative requirements for the specified resource(s).

b. AGGREGATE RESOURCE SUMMARY GRAPH (See Figure 37).

This report lists the minimum, expected, and maximum requirements resource utilization of the specified resource over the entire duration of the project.

As indicated ("X" = Percent Probability (rounded); "C" = Cumulative Percent Probability), the graph charts the percent probability that the Total Resources expended would be at that specified percent probability (i.e., where the X's end; cumulative probability for total project is indicated by the C's).

BOILER REPAIR MODEL 11468771		PAGE 39	
AGGREGATE RESOURCE HISTORY			
TOTAL COST		DESCRIPTION : GENERAL TECHNICIANS	
RESOURCE CODES :	GENTECH GENMACH CHIEFTECH PREFTECH MAINTENANCE GEN. MAINT. MEN	GENERAL TECHNICIANS GENERAL TECHNICIANS GENERAL TECHNICIANS GENERAL TECHNICIANS GENERAL TECHNICIANS	
UPDATED ON	14 FEB 77		
		MINIMUM VALUE : 5TH PERCENTILE	MINIMUM VALUE : 5TH PERCENTILE
		MAXIMUM VALUE : 95TH PERCENTILE	MAXIMUM VALUE : 95TH PERCENTILE
		NET PER WORKDAY (DOLLARS)	CUMULATIVE NET (DOLLARS)
		(MIN)	(MAX)
DATE		(MIN)	(MAX)
1 FEB 77	*	248	248
2 FEB 77	*	248	746
3 FEB 77	*	248	746
4 FEB 77	*	311	1055
5 FEB 77	*	311	1055
6 FEB 77	*	435	1206
7 FEB 77	*	435	1206
8 FEB 77	*	435	1206
9 FEB 77	*	435	1206
10 FEB 77	*	435	1206
11 FEB 77	*	435	1206
12 FEB 77	*	435	1206
13 FEB 77	*	435	1206
14 FEB 77	*	435	1206
15 FEB 77	*	435	1206
16 FEB 77	*	435	1206
17 FEB 77	*	435	1206
18 FEB 77	*	435	1206
19 FEB 77	*	435	1206
20 FEB 77	*	435	1206
21 FEB 77	*	435	1206
22 FEB 77	*	435	1206
23 FEB 77	*	435	1206
24 FEB 77	*	435	1206
25 FEB 77	*	435	1206
26 FEB 77	*	435	1206
1 MAR 77	*	435	1206
2 MAR 77	*	435	1206
3 MAR 77	*	435	1206
4 MAR 77	*	451	1256
5 MAR 77	*	469	1265
6 MAR 77	*	469	1265
7 MAR 77	*	471	1276
8 MAR 77	*	471	1276
9 MAR 77	*	512	1328

* ACTUAL VALUE + SUM OF ACTUAL PLUS REMAINING PROJECTED VALUE

Figure 33. Aggregate Resource History.

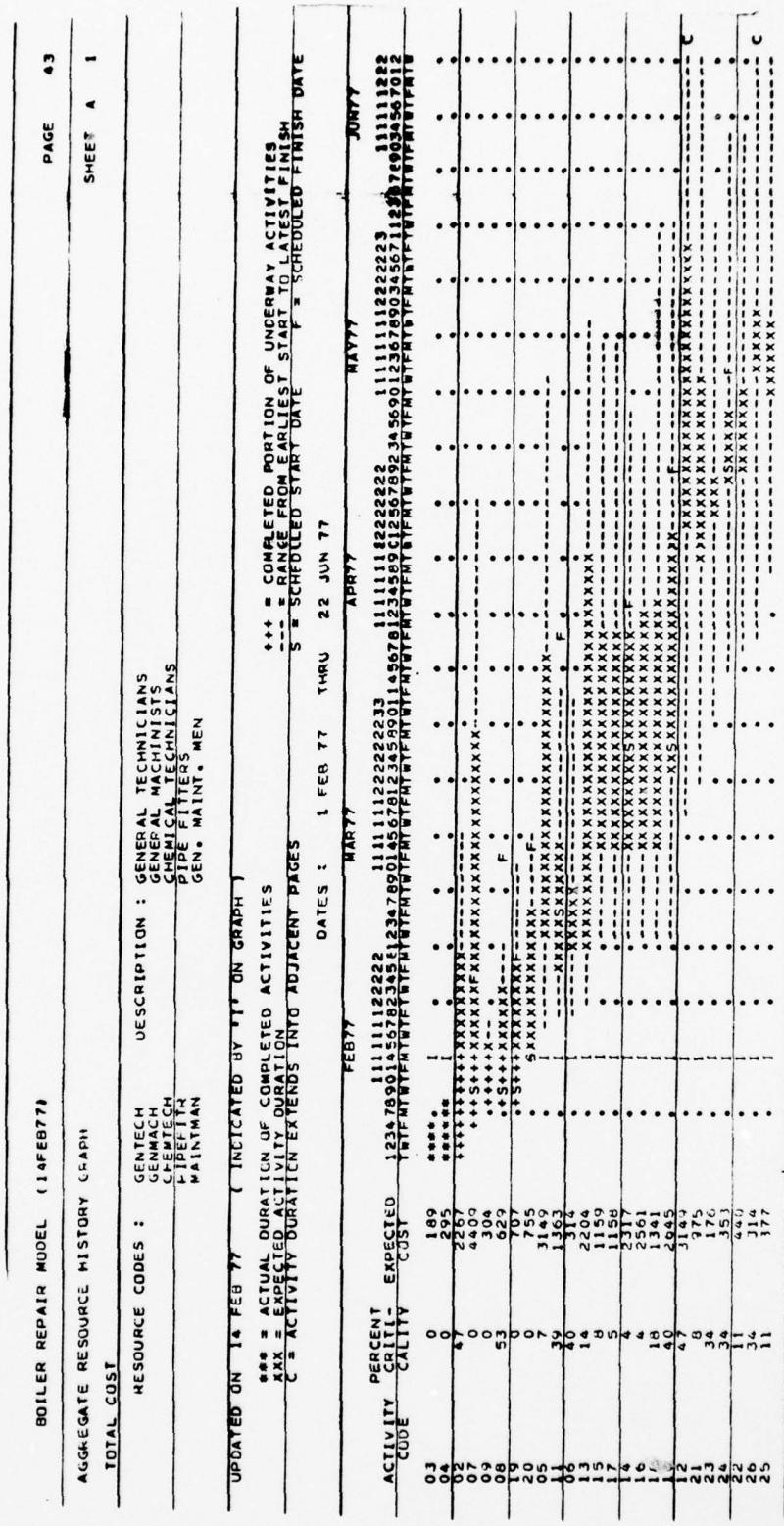


Figure 34. Aggregate Resource History Graph (Schedule).

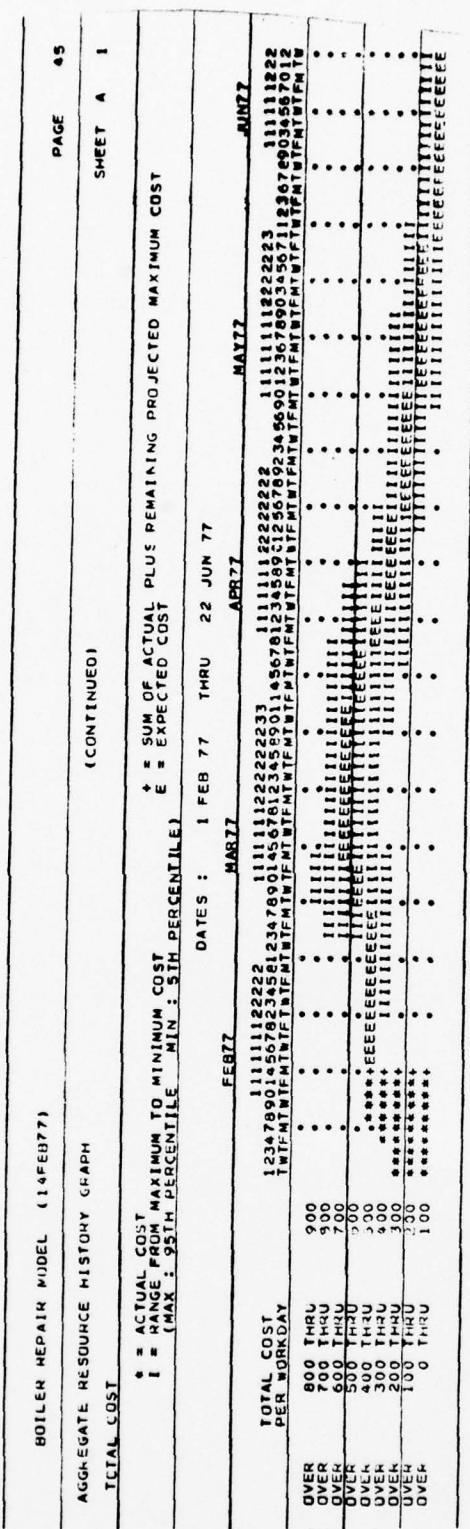
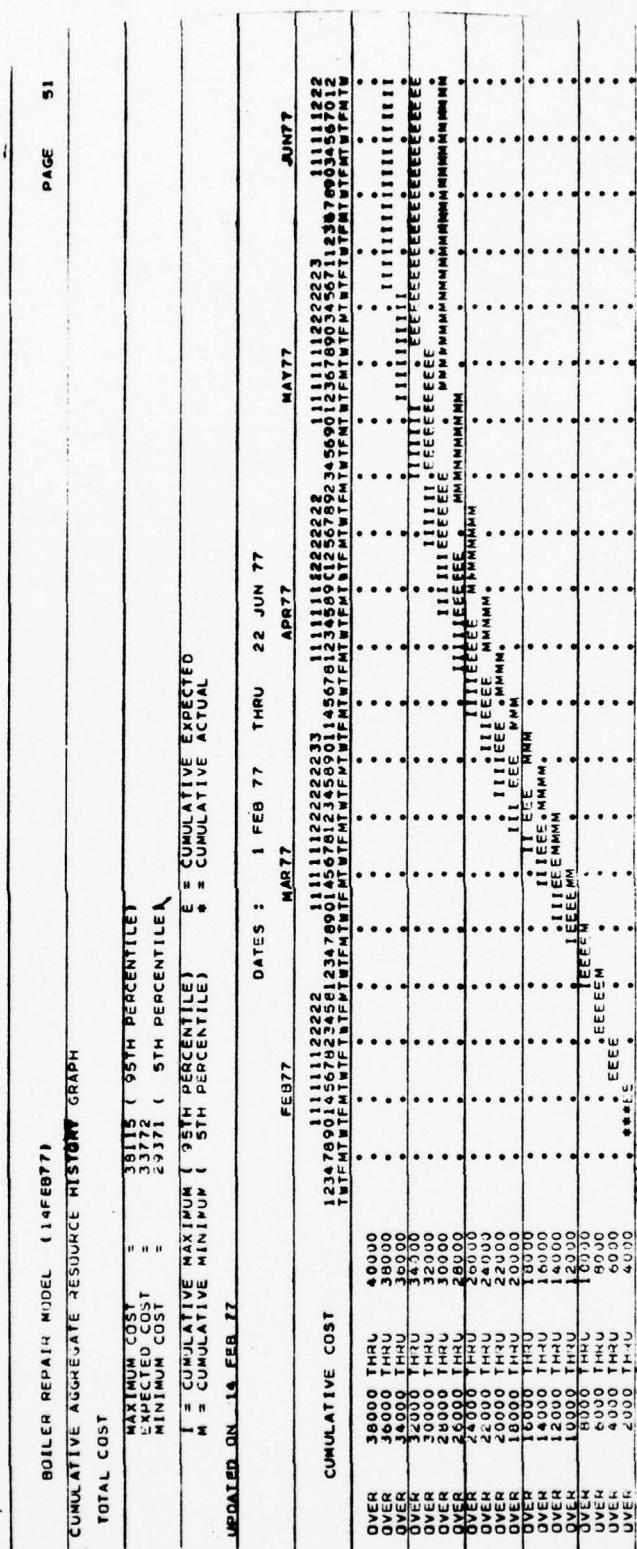


Figure 35. Aggregate Resource History Graph (Summary).



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Figure 36. Cumulative Aggregate Resource History Graph.

Figure 37. Aggregate Resource Summary Graph.

17. ACTIVITY STATUS REPORTS.

The ACTIVITY STATUS REPORT is generated for a specific Time Period and Responsibility Code. All activities having a particular Responsibility Code are listed by their Activity Code and Description in chronological order. All reports list Network Code (if given), Activity Code and Description, and Percent Criticality.

There are three basic kinds of Activity Status Reports. These are:

- a. ACTIVITY STATUS REPORT (For Activities Underway for Responsibility). This section lists those activities actually underway at the beginning of the specified time period interval, together with Actual Start Dates, plus the four possible Finish Dates (Schedule, Earliest, Expected, and Latest). Scheduled Dates are listed when supplied on FORM C-1A. If an activity has been completed, the Actual Finish Date is listed under the Expected Finish Date column.
- b. ACTIVITY STATUS REPORT (For Activities Due to Start). In this section, all activities for the given responsibility which have started or have some possibility of starting within the specified report time period, are listed.
- c. ACTIVITY STATUS REPORT (For Activities Due to Complete). In this section, all activities for the specified responsibility which have actually been completed or have any possibility of being completed within the report time period, are listed.

BOILER REPAIR MODEL ----- 29SEPT77			PAGE 70		
ACTIVITY STATUS REPORT					
PERIOD =	7FEB77	THROUGH	25FEB77		
ACTIVITIES UNDERWAY			(UNDERWAY AS OF BEGINNING OF 7FEB77)		
ACTIVITY CODE	ACTIVITY	ACTIVITY DESCRIPTION	PERCENT CRITICAL-ALITY	ACTUAL START DATE	FINISH SCHEDULED DATE
04	INITIAL HYDROSTATIC TEST	1 FEB 77	0	1 FEB 77	7 APR 77
04	REMOVE BOILER BILGE CASING	1 FEB 77	0	2 FEB 77	8 APR 77
04	CLEAN REPAIR TIR REGISTER ASSEMBLY	1 FEB 77	0	2 FEB 77	13 SEP 77

Figure 38. Activity Status Report (Activities Underway).

BOILER REPAIR MODEL ----- 295B77						
ACTIVITY	STATUS	REPORT	PERIOD	THROUGH	25FEB77	25FEB77
ACTIVITIES DUE TO START	YARD					
NETWORK	ACTIVITY CODE	ACTIVITY DESCRIPTION	PERCENT CRITICALITY	TIME SCHEDULE	EARLIEST DATE	EXPECTED LATEST DATE
1	09	REMOVE DRUM INTERNALS	0	25FEB77	25FEB77	25FEB77
	08	REMOVE REFRACRY MATERIAL	53	25FEB77	25FEB77	25FEB77
1	19	RIG FOR CHEMICAL CLEANING	0	25FEB77	25FEB77	25FEB77
	1	REPAIR DRUM INTERNALS	0	14FEB77	16FEB77	16FEB77
1	20				01MAR77	01MAR77

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Figure 39. Activity Status Report (Activities Due to Start).

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BOILER REPAIR MODEL ----- 295EP77			PAGE	72
ACTIVITY STATUS REPORT		PERIOD =		
		7FEB77	THROUGH	25FEB77
ACTIVITIES DUE TO COMPLETE				
NETWORK	ACTIVITY CODE	ACTIVITY DESCRIPTION	PERCENT CRITICALITY	TIME SCHEDULE
1	04 C9	INITIAL HYDROSTATIC TEST REMOVE DRUM INTERNALS	8	16FEB77 3FEB77 25FEB77 8MAR77

Figure 40. Activity Status Report (Activities Due to Complete).